The RUBBER AGE

Published TWICE-A-MONTH at New York

Vol. 21 JUNE 25, 1927 No. 6

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Vol. 21 No. 6 June 25, 1927. THE RUBBER AGE, Published by The Palmerton Publishing Co., Inc., 250 West 57th St., N. Y. City
Entered as Second Class Matter, June 10, 1920 at the Post Office at Highland, N. Y., under Act of March 3, 1879.

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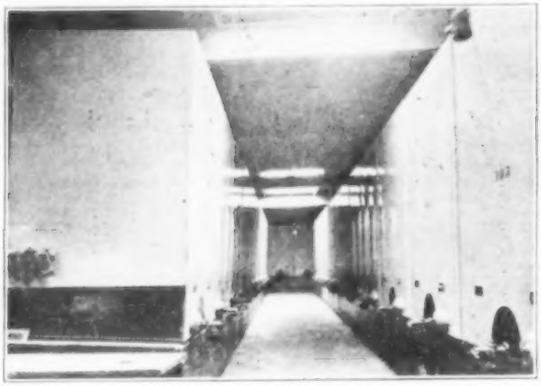

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Published Twice-a-Month by

The PALMERTON PUBLISHING CO., Inc.
Fisk Building, 250 West 57th. St., N. Y. City

P. L. PALMERTON, *Editor* — PETER P. PINTO, *Business Manager*

Vol. 21 — June 25, 1927 — No. 6

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Entered as Second Class Matter, June 10, 1920, at the Post Office at Highland, N. Y., under Act of March 3, 1879.

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The
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Vol. 21 NEW YORK, JUNE 25, 1927 No. 6

RUBBER PRICES SHOW UNEXPECTED DECLINE

Several Causes are Advanced for Sudden Break of More than Five Cents per Pound After Prolonged Quiet — Big Trading on Rubber Exchange of N. Y.

Excited activity which recalled the feverish days of 1925 and early 1926 has marked the crude rubber market during the last three weeks, during which time prices broke more than five cents per pound. In view of the fact that prices had not moved so much as three cents in all the preceding four months, the sharp decline was all the more startling.

The Rubber Exchange, which was getting accustomed to listless days on which only 50 lots or so would be traded in, set two new records for activity. On June 9 there were 1,667 lots traded which was a new high record since the Exchange was established; on June 16 trading was again heavy, a total of 1,441 lots changing hands. On other days more than 1,000 lots changed hands and activity in several hundred lots became the usual thing.

The sharp and sudden break in prices was attributed to several factors. Rumors of a sweeping reduction in automobile tire prices became common after price adjustments were made by some companies on a few small sizes of second grade tires. This had a distinct unsettling effect. In addition, the slight curtailment of tire production in the Akron district and the slowing up of the automobile factories were seriously regarded. The crude rubber statistical position has changed but little but that in itself has been construed as a bear point since the tightening of British rubber restriction on May 1 was supposed to have an early effect. In addition, the slight curtail- there has been a complete lack of evidence that supplies were not ample and the general shaking out of the speculative element followed.

Unfounded reports that the so-called American rubber pool was going to cease operations and unload its holdings was one of the strongest of the bearish influences. A denial of this report appeared on June 16 and was responsible for stopping the downward stampede. The pool was organized last December and was to have run, it is understood, until August 1. According to the present understanding, the members of the pool have agreed to its extension for eight months from that date.

September and October positions have been featured in the Exchange trading, many of those holding nearby rubber shifting to those months. The closing sales of July made on the Exchange on June 16 were at 35.40 cents while September and October were slightly higher. The outside market on the 16th closed with spot ribbed smoked sheets at 35 cents as compared with 40 3/4 cents on May 31.

Refutation of most of the reports which had a weakening effect on crude rubber prices and gradual realization that the statistical position was no more than comfortable checked the decline on the 16th and a steadier market followed.

Gives Hoover Credit

F. R. Henderson, president of the Rubber Exchange of N. Y., believes Herbert Hoover should be given credit for bringing about the present rubber price situation.

"The conservation policy instigated by Secretary Hoover about eighteen months ago has borne the fruit of a considerable increase in the use of reclaimed rubber", Mr. Henderson said at the close of the busy trading days on the Exchange. "It is only now that the British producer is realizing that the move was not one of propaganda or American 'bluff'. Whatever may be said in favor of the inauguration of British rubber restriction five years ago, there has been nothing in the last three years to justify its continuance".

General Rubber To Build

It is reported that the General Tire & Rubber Co., of Akron, will add two more wings to its factory at once. The two buildings will be three stories high and will provide more than 100,000 feet of extra floor space, affording the company to manufacture approximately 3,000 additional tires a day.

RUMORS OF TIRE PRICE REDUCTION PERSISTENT

Tire Companies Deny That General Cut Will Follow the Slight Price Changes Instituted by Mail Order Houses—Revival of Consumer List Considered.

In spite of firm denials by tire manufacturers that any general reductions in tire prices are contemplated, rumors have persisted that such changes would be made probably on July 1, if not before. These reports have been partly responsible for the tumble taken by crude rubber prices in the last three weeks.

The rumors of tire price reductions appear to come wholly from the slight rearrangement which certain companies made in their lists to meet the cut which mail order houses made early in June. Only two or three sizes in the secondary line of tires were affected in any case and the reduction was a trifling one averaging less than one dollar per tire. It was accepted, however, as a sign that the entire tire price schedule would be revised later and rumors to that effect have been persistent.

The reductions actually made by Goodyear, Fisk, United States Rubber, and Dunlop averaged around 5 per cent and four small sizes or less were affected, these being fabrics and clincher cords.

The lower rubber prices of the last three weeks have given point to the rumor of a general tire price reduction, without taking into consideration that the cheaper rubber will not be used by the tire factories for some weeks or months. The advances made in the prices of cotton fabrics have already nullified any advantage that may come from lower rubber prices.

The uneasiness over tire prices has brought more clearly to the front the question of issuing consumer price lists again, it being claimed by many that when each dealer makes his own prices, rumors have greater effect. One company has already reinstituted its printed list of suggested prices to consumers. Dealers' organizations appear to be favoring such a movement.

MEETING OF GOODYEAR STOCKHOLDERS JULY 11

P. W. Litchfield Asks for Cooperation of Stockholders in Reorganization—Larger Board of Directors Proposed—Three Year Term for President.

In a letter addressed to stockholders of the Goodyear Tire & Rubber Co., of Akron, P. W. Litchfield, president, has asked their cooperation in the immediate readjustment of the financial affairs of the company, now that the mass of litigation in which it was involved has been cleared away. After outlining the various matters to be taken up at a meeting which is called for July 11 at Akron, Mr. Litchfield said in his letter: "Your board of directors and executive officers are convinced that the proposals herein set forth are in the best interests of the stockholders of the company's stocks. At this time, when all interests have united to terminate the stockholders' litigations and have agreed upon the above proposals to refund senior securities and rearrange the company's capitalization for the benefit of its stockholders, it is important that all stockholders cooperate promptly."

Among the important matters which the stockholders will be asked to consider, will be the ratification of the re-organization plans; replacement of the securities issued in 1921, by long term bonds with low interest rates; abolition of voting trusts and management stock, and restoration of voting rights to stockholders. The present 8% bonds and debentures are to be retired and $60,000,000 in 5% 30-year bonds are to be issued. Arrears in preferred stock dividends amounting to 25% are to be provided for by issuance of new preferred stock to the present holders, in the ratio of 5 shares to 4.

Larger Board of Directors

The stockholders will be asked to approve the enlargement of the present board of directors to 17 members who are to hold office until 1930 after which they will be elected annually. The following are nominees for the board of directors: Clarence Dillon, of Dillon, Reed & Co., John Sherwin, Dr. Robert H. Bishop, Jr., Fayette Brown, George B. Durell, E. B. Greene, J. A. House, Elton Hoyt, II, Samuel Lewis Smith, G. A. Tomlinson, P. W. Litchfield, Francis Seiberling, H. B. Manton, R. L. Robinson, Walter B. Mahony, Grayson M. P. Murphy and R. C. Shaffner.

In order to care for the default of dividends on existing preferred stock, so that the company may pay dividends on its common stock, Mr. Litchfield in his letter proposes to take advantage of the recently enacted General Corporation Act of Ohio which permits the issuance of preferred stock without par value, and create a new class of stock without par value which is to be offered for exchange to the holders of existing preferred stock, on the basis of 1 1/4 shares of new preferred stock for 1 share of existing preferred stock.

Joins Dayton Rubber Co.

Lynn Harvey

Two important changes have been made in the executive personnel of the Dayton Rubber Co., of Dayton, O., according to an announcement of John A. MacMillan, president and general manager. D. W. Warden, who was formerly general credit manager, has been made vice-president in charge of merchandising, a position embracing both general sales and credits. Lynn Harvey, formerly divisional sales manager for the India Tire & Rubber Co., of Akron has been secured for the position of supervisor of tire sales.

Norwalk Passes Dividend

The Norwalk Tire & Rubber Co., of Norwalk, Conn., failed to declare the regular quarterly dividend of $1.75 on the 7% cumulative stock, which would ordinarily be paid July 1. John W. Ingram, vice-president of the company, pointed out, however, that the company could take this action at any time, but admitted that their failure to act at the last director's meeting indicated that this payment would be omitted.

At a special meeting of stockholders held in April it was voted to change the outstanding common stock from 150,000 shares of $10 par value to 150,000 shares of no-par value and to offer to both common and preferred stockholders, pro-rata, 100,000 shares of new no-par common stock at $5 a share. So far this new stock has not been offered, but the approval of the stockholders was given with the understanding that the stock could be offered at any time up to September 1, 1927.

Manhattan Rubber Exhibits

A two weeks display of its entire line of products was conducted by the Manhattan Rubber Manufacturing Co., of Passaic, N. J., in a department store in that city. The exhibition was for New Jersey industries. The Manhattan company manufactures mechanical rubber goods and brake linings. A. F. Townsend is president and general manager.

MAY RUBBER IMPORTS EXCEED CONSUMPTION

Rubber Association Estimates May Imports at 36,569 Long Tons and Consumption About 34,600 Long Tons—Total Stocks on Hand and Afloat Less Than in April.

Consumption of crude rubber in the United States during May, based on 100%, amounted to 34,600 long tons, while crude rubber imports during May totaled 36,569 long tons, or 1,969 long tons in excess of consumption, according to figures compiled by the Rubber Association. May consumption shows a falling off of 1,271 long tons from April when consumption reached the high total of 35,871 long tons. Crude rubber consumption in May, 1926, totaled 29,364, while consumption in the corresponding period of 1925 was 35,322 long tons.

Crude rubber imported during May, as estimated by the Rubber Association, was 36,569 long tons. Imports for the corresponding period a year ago totaled 30,411 long tons, while total importations for five months ending May 31, 1927 amounted to 193,656 long tons, and in the five months of 1926, 178,530 long tons. Compared with the official estimate of the Department of Commerce, the Rubber Association figure on imports is 1,271 long tons more than that compiled by the Government, which is 34,413 long tons. The following table affords a comparative analysis of crude rubber imports in May, 1926 and May, 1927:

	May, 1926	May, 1927
Plantations	27,915	33,735
Paras	1,431	1,872
Africans	199	197
Centrals	449	399
Guayule	417	364
Manicoba and)	...	2
Matto Grosso)	...	...
TOTAL	30,411	36,569

Total stocks of crude rubber on hand and afloat at the end of May, according to Rubber Association figures, raised to 100%, were 127,740 long tons. This compares with 131,720 long tons in April and 104,663 long tons in May of last year. Stocks on hand at the end of May totaled 94,625 long tons, the largest amount on hand during any one month in the last three years. This total compares with 92,625 long tons on hand in April, and 64,360 long tons on hand in May, 1926. While stocks on hand are the largest in three years, tonnage afloat to the United States during May was the smallest recorded in the past three years.

Appleton Rubber Rebuilds

The plant of the Appleton Rubber Co., of Franklin, Mass., which was destroyed by fire several months ago, will be rebuilt and work is to be resumed on a moderate scale about July 1. Two one-story buildings are to be restored immediately and equipped with new machinery, while three other buildings, also burned in the fire, are to be rebuilt as soon as conditions warrant. The company manufactured insulated tape and reclaimed rubber.

START GRUBB RUBBER COMPANY NEAR AKRON

New Company Headed by D. A. Grubb Who Was Associated With The India Tire & Rubber Company—Plant Located In Wadsworth—Produce Tires

Another rubber company organized in May has started business in the Akron district. This new company is known as the Grubb Rubber Co., and is located in Wadsworth, O., a suburb of Akron. D. A. Grubb is president and general manager. He was one of the organizers in 1917 of the India Tire & Rubber Co., of Akron, directing the sales of that company until several months ago when he disposed of his interests and resigned his position.

With Mr. Grubb is associated in the new company W. E. Griesinger of Medina, O., who will be vice-president, and H. C. Allyn, formerly in charge of repair materials departments with B. F. Goodrich and the Miller Rubber Co., will be secretary. While working for the Miller company in 1923 Mr. Allyn resigned to become associated with Mr. Grubb and the India Tire & Rubber Co., where he directed the sales of repair materials. He left the India company several months ago in order to assume his new duties with the Grubb Rubber Co. Frank L. Lytle of Wadsworth, O., is treasurer of the new firm.

The plant is entirely modern and is equipped with new machinery all of which is operated by electric power. The building is two stories high providing 37,000 square feet of floor space and is situated next to railroad lines. In launching the new company Mr. Grubb announces that it will manufacture tires and molded tubes together with a full line of repair materials designed to meet every demand of jobbers and consumers, and a varied line of mechanical rubber goods including men's rubber belts, floor mats, etc.

India Tire Pays Dividends

The India Tire & Rubber Co., of Akron, announced on June 17 a quarterly dividend of 45 cents a share on the common stock and the regular quarterly of $1.75 on the preferred, both payable July 1 to stock of record June 20. A dividend of 62 cents had been paid previously on the common. According to directors of the company, the reduction in dividends on the common was to conserve assets and thereby better finance expansion needs.

Firestone Dividends

Regular quarterly dividends of $1.50 were declared on the common stock June 14 by the Firestone Tire & Rubber Co., of Akron. Dividends of $1.50 were also declared on the 6% preferred, payable July 15, and $1.75 on the 7% preferred, payable August 15.

D. A. Grubb

EDISON STILL WORKING ON RUBBER PROBLEMS

Thomas A. Edison, who returned to his New Jersey laboratory last month after spending the winter experimenting with rubber plants on his estate at Fort Myers, Fla., is apparently not abandoning his interest in the subject. On June 16 he paid a lengthy visit to the Botanical Garden of New York City where several different rubber plants are growing. Mr. Edison examined these with great interest and tapped some of the trees with which he was not already familiar. Some latex specimens were taken to his laboratory for testing.

Mr. Edison said last winter that after he returned north he would continue work on the combination reaper and press by means of which he hopes to make rubber production in the United States practical. He refuses, however, to furnish information concerning the work, saying that announcements should wait until he has made definite accomplishments.

Triangle and Monarch Busy

The Triangle Tire & Rubber Co., of Canton, O., and the Monarch Rubber Co., of Hartville, O., are both reported to be operating on unusually heavy production schedules. The Triangle company is producing about 600 tires a day, according to M. C. Wyatt, general manager. Molded tubes are being turned out at the rate of 350 to 400 a day. The Monarch company was putting out 500 tires a day several weeks ago with the prospect of increasing production to 750 in June. Two new factory units are about completed, and it is reported that more men have been added to the Monarch payrolls.

RESTRICTION TO STAND SAYS BRITISH OFFICIAL

Rumors or Cancellation of Scheme Brings Announcement That Such a Move is Not Contemplated by British Gov't—Some Revision in Regulations is Likely.

L. C. M. Amery, British Secretary of State for the Colonies, announced in the House of Commons on June 16 that the British Government was not contemplating the cancellation of the rubber restriction act now affecting British Malaya and Ceylon, as had been persistently rumored since June 1. Although made in a reply to a question, it was regarded in the rubber trade that the announcement was forced by the sharp declines which have been made in the price of crude rubber and in rubber plantation shares since the rumor has been current.

While the present declaration does not mean that Secretary Amery cannot and may not change his mind, it is believed in London that it is a truthful statement of the present attitude of the British government. The Colonial Office is regularly advised on rubber matters by a committee which is dominated by the largest plantation owners and managers and these men are still almost unanimous in their feeling that restriction should be continued indefinitely.

In certain quarters, however, it is felt that some steps should be taken to make restriction less severe. One suggestion is that the pivotal price be cut from 42 cents to 30 cents, where it was when the scheme was first put into operation. The high prices of 1925 apparently misled the British into the belief that such a price could be regularly secured although it was considerably beyond the level at which restriction first aimed. The continued and increasing use of reclaimed rubber and the stimulation of production in other areas has proved the price to be uneconomic at this time.

Even before Secretary Amery made his statement, it had been pointed out that the abrupt abolition of restriction would be so hazardous for both producers and consumers as to be almost impossible. If such a plan were announced shortly before the move were made, trading would of course, adopt a waiting attitude at once; on the other hand, overnight cancellation would demoralize trading completely and upset both sides. Revision of some sort is much more probable than is outright cancellation.

Gates Items on Dodge

The Gates Rubber Company, Denver, Colo., has announced that it is supplying the Dodge Motor Company with more than twenty different items for use on the new 4- and 6-cylinder Dodge cars. These include fan belts, radiator hose, car mats, weather strips, rubber bumpers and other mechanical parts. Gates has recently signed a new distributor for its goods in Baltimore, making a total of eleven in the East.

APRIL TIRE AND TUBE OUTPUT STILL AHEAD

Casings and Tubes of All Types Increased In April Production According to the Rubber Association Statistics—Output Exceeds Shipments—Inventories Grow.

While tire and tube production during the month of April shows an increase over March, the margin of increase is not as great as occurred in the period from February to March. The output of automobile casings in April, based on a 100%, totaled 6,299,667, which, compared with March production of 6,276,896 casings, does not show a very great increase. The increase in April tube production is similarly small, namely 7,373,248 in comparison to 7,184,146, both figures having been raised to 100%.

Shipments of both casings and inner tubes during April were less than production, a situation which has prevailed during the past three months. April shipments of tires, raised to 100%, totaled 5,701,952 as compared to 5,701,476 in March. As may be seen, the margin of increase in April shipments is very slight over that of March. Shipments of tubes during April, on a basis of 100%, amounted to 6,359,180 as compared with 6,157,820 in March.

Inventories of both casings and inner tubes have increased proportionately. April inventory of casings on a 100% basis totaled 12,122,382 and inventory of inner tubes totaled 17,801,874. This compares with March inventory of casings of 11,583,082 and inner tubes totaling 17,096,005.

Balloon tires and inner tubes continue to hold the lead in all types of tire and tube production. During April production was not as heavy in this class as during March, and shipments were less with proportionate increases in inventory.

March and April figures of the Rubber Association, raised to 100%, follow:

	April, 1927	March, 1927
Pneumatic Casings		
Inventory	12,122,382	11,583,082
Production	6,299,667	6,276,896
Shipments	5,701,952	5,701,476
Inner Tubes		
Inventory	17,801,874	17,096,005
Production	7,373,248	7,184,416
Shipments	6,359,180	6,157,820

Converse Rubber Defers

The Converse Rubber Shoe Co., of Malden, Mass., deferred payment of its quarterly dividend of $1.75 per share on its 7% cumulative preferred stock due June 1. According to a letter of M. M. Converse, president of the company, to stockholders, payment has been deferred for the reason that several brokers have been trading out the stock for their own securities and dumping it in the Boston Auctions. This has created an unsettled condition in the market for the stock.

The company reports sales for the fiscal year ended March 31 to be $5,100,000, but earnings were less than usual. Advance sales of footwear are now said to be 39% ahead of a year ago. The company manufactures rubber footwear, tires and tubes.

MADE FACTORY MANAGER OF MOHAWK RUBBER CO.

R. C. Gunther

The appointment of R. C. Gunther as factory manager of the Mohawk Rubber Co., of Akron, was recently announced by S. S. Miller, president and general manager of the company. Mr. Gunther is experienced in production supervision, having started in that capacity with a division of Continental Motors in Detroit.

During the war he directed the making of shells with Winslow Brothers and subsequently entered the production end of the tire industry with the Inland Rubber Co., of Chicago, where he held the post of factory superintendent for six years. Later Mr. Gunther and a group of friends purchased the McKone Tire & Rubber Co., of Millersburg, O. Here he served two years as superintendent of production before accepting his appointment as factory manager of the Mohawk company.

DALLAS CORPORATION STARTS RUBBER PLANT

The Guiberson Corporation of Dallas, Texas, manufacturers of oil well tools and equipment, has opened a mechanical rubber molding plant with a capacity of about 4,000 pounds a week. The factory will manufacture rubber appliances for use in oil well equipment. The company has been conducting experiments with guayule rubber and it is understood that its products will be manufactured from this shrub.

The Guiberson Corporation, which has been located in Dallas for some time, exports from that city much of the oil well equipment which it manufactures. I. C. Bell will be manager of the rubber department.

MAY RIM INSPECTION INCREASES OVER APRIL

Total Rims Inspected and Approved During May 2,169,208—Slight Decrease In Balloon Average—Truck Rims Inspected 7.6%—Less Than in April.

Rims inspected and approved during May totaled 2,169,208 which compares with 2,059,868 rims inspected in April. Balloon rims constituted 86.9% of all rims inspected during May. It will be noted in the table below that the grand total of inspected rims for the first five months of 1927 is considerably less than the total for the five months of 1926, a difference of 1,542,224 rims.

RIMS INSPECTED AND APPROVED

Rim Size	May 1927 Number	%	5 Mos. 1927 Number	%	5 Mos. 1926 Number	%
Motorcycle						
24x3	4,458	0.2	16,378	0.2	15,578	0.2
26x3	9,087	0.4	18,081	0.2	41,918	0.4
28x3	139	0.0	920	0.0	2,377	0.0
Total	13,684	0.6	35,379	0.4	59,873	0.6
Clinchers						
30x3	—	—	—	—	2,302	0.0
30x3½	69,685	3.2	365,940	3.8	1,619,780	14.6
31x4	—	—	9,828	0.1	15,609	0.2
Total	69,685	3.2	375,768	3.9	1,637,691	14.8
18" Balloons						
25x3½	—	—	100	0.0	722	0.0
26x4	92,657	4.3	411,733	4.3	—	—
27x4½	4,478	0.2	18,634	0.2	—	—
28x5	—	—	242	0.0	—	—
Total	97,135	4.5	430,709	4.5	722	0.0
19" Balloons						
26x3½	117,356	5.4	315,336	3.3	16,152	0.2
27x4	246,346	11.5	342,322	3.6	72	0.0
28x4½	45,111	2.1	223,939	2.3	—	—
29x5	10	0.0	1,187	0.0	—	—
Total	408,823	19.0	882,784	9.2	16,224	0.2
20" Balloons						
27x3½	16,914	0.8	97,598	1.0	26	0.0
28x4	169,738	7.8	1,166,789	12.2	1,223,838	11.0
29x4½	37,735	1.7	172,137	1.8	208,389	1.9
30x5	39,894	1.9	123,734	1.3	142,745	1.3
Total	234,281	12.2	1,560,258	16.3	1,574,998	14.2
21" Balloons						
28x3½	763,898	35.2	3,232,546	33.9	4,407,267	39.8
29x4	244,906	11.3	1,237,709	13.2	1,485,006	13.4
30x4½	87,607	4.0	591,568	6.2	758,073	6.7
31x5	9,734	0.5	92,148	0.9	216,205	2.0
33x6	4,166	0.2	31,600	0.3	60,049	0.5
Total	1,110,311	51.2	5,185,571	54.5	6,926,600	62.4
22" Balloons						
29x3½	—	—	146	—	—	—
30x4	1,013	0.0	3,496	0.0	2,946	0.0
31x4½	—	—	4,055	0.0	21,044	0.2
Total	1,013	0.0	7,697	0.0	23,990	0.2
High Pressure						
30x3½	6,282	0.3	41,617	0.4	64,878	0.6
31x4	—	—	1,991	0.0	10,183	0.1
32x4½	11,495	0.5	88,572	0.9	185,053	1.7
32x4	18,954	0.9	71,377	0.8	85,904	0.8
33x4½	—	—	395	0.0	496	0.0
32x3½	—	—	2,196	0.0	4,660	0.0
33x4	510	0.0	2,128	0.0	3,978	0.0
34x4½	353	0.0	11,016	0.1	10,140	0.1
Total	37,594	1.7	219,292	2.2	365,294	3.3
20" Truck						
30x5	126,661	5.8	678,729	7.1	275,925	2.5
32x6	20,176	0.9	85,205	0.9	103,667	0.9
34x7	1,794	0.2	24,744	0.3	16,829	0.2
36x8	3,308	0.2	8,154	0.1	3,869	0.0
40x10	299	0.0	602	0.0	189	0.0
Total	155,238	7.1	797,434	8.4	400,479	3.6
22" Truck						
36x7	—	—	696	0.0	1,186	0.0
Total	—	—	696	0.0	1,186	0.0
24" Truck						
34x5	2,393	0.1	15,442	0.2	21,211	0.2
36x6	5,088	0.2	18,111	0.2	42,606	0.4
38x7	3,358	0.2	8,644	0.1	9,320	0.1
40x8	645	0.0	5,533	0.1	4,955	0.0
44x10	—	—	—	—	393	0.0
Total	11,444	0.5	47,730	0.6	78,485	0.7
GRAND TOTAL	2,169,208		9,543,318		11,085,542	

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The Universal Softener

ADAPTABLE

For Tires, Mechanicals, Frictions, Hard Rubber, Reclaims.

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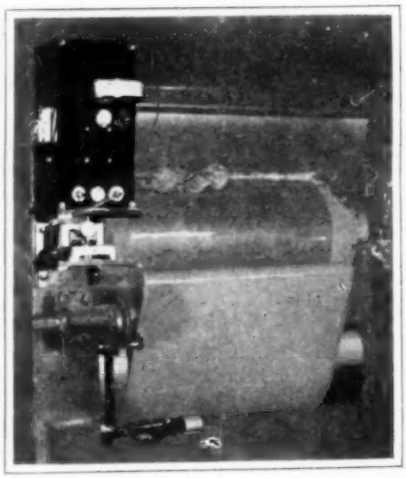
INVENTS GAUGE FOR USE WITH RUBBER CALENDERS

Announcement that all tests have been completed on the Schuster Magnetic Thickness Gauge, and that this device is now being installed by several large tire manufacturers, marks the successful consummation of experiments by P. B. Schuster, the inventor, in the factories of The Seiberling Rubber Company, Barberton, O., where all development work has been done. The Schuster gauge measures within 1/1000″ the thickness of any non-magnetic material such as rubber, brass, or paper while the material is being run through calender machines.

Since it depends on a new application of the magnetic principle, the Schuster thickness gauge by varying magnetism based on the principle of balanced magnetic circuit, makes it possible to calender rubber stocks, including frictions, uniformly, so that the calendered stock is neither over-gauge nor under-gauge. The accompanying illustration shows the application of one of the gauges on a calender in the Seiberling factory. The small revolving wheel is applied directly to the stock being run. The large dial registers the thickness of the stock within 1/1000″. Thus, the calender operative has a constant dial record and can control stock thickness to an accuracy hitherto not to be obtained.

It is predicted that the Schuster gauge will be installed in the near future by all major tire companies inasmuch as its savings by prevention of over-gauge and its assurance of uniform quality of product by prevention of under-gauge are of very high importance. For instance, the over-gauge of 1/1000″ in the production of a 29 x 4.40 tire adds about 15 cents to the cost of that tire.

All of the development work on this gauge was done in the laboratories of The Seiberling Rubber Company which has been using it successfully on its calenders for some months. It is claimed that this device is the only thickness gauge applied direct to the calender roll and that it is the only device which gauges thin skim coats on the run.



The Schuster Magnetic Thickness Guage, in Use on a Rubber Calender

Mr. Schuster is well-known in the rubber industry and in electrical circles. He was formerly chief engineer of the Goodyear Tire & Rubber Company.

He says that despite its accuracy his new gauge is in no way a laboratory instrument. It contains no easily breakable parts and can stand severest factory abuse.

Although the immediate application of the device will be broad throughout the rubber industry, it is believed that it will find an even wider market in the paper industry and in the manufacture of brass and other non-magnetic metal products. The Magnetic Gauge Company of Akron, Ohio, own exclusive rights to manufacture and distribute it.

SALES OF CAMBRIDGE RUBBER $3,878,867

The total sales of the Cambridge Rubber Co., of Cambridge, Mass., amounted to $3,878,867 through the fiscal year ended March 31, 1927. During this year the company achieved a net profit of $302,586 before preferred dividends of $10,846.50 and common dividends of $5,000. An initial common dividend of 25 cents a share was declared in February. Capitalization of the Cambridge company consists of $155,400 of $100 7% cumulative preferred par stock and 20,000 shares of no par common stock. The fiscal year just passed was the best in the company's history.

The Cambridge Rubber Co. employs about 1400 men manufacturing rubber and canvas footwear, clothing and molded goods. It was incorporated in 1923 with Warren MacPherson as president and treasurer; George R. Rockwell, vice-president and assistant treasurer in charge of sales, and E. W. Dunbar, vice-president in charge of manufacturing.

Fire Hose Report Held Up

It was expected that the American Society for Testing Materials would hear at its annual meeting on June 20 a report of its sectional committee on specifications for rubber-lined fire hose but shortly before the meeting the Society announced that the committee would not be ready to report. The committee was organized on November 5, 1926, under the joint sponsorship of the A. S. T. M. and the A. E. S. C. Fire Protection Group and was assigned the problem of developing standards of construction and performance under test of rubber-lined fire hose for use by private and public fire departments. There are 14 committeemen. Several meetings have been held but more will be required before the work is completed.

MUST PAY ONE FIFTH ROYALTY ON INVENTION

The inventor of the so-called water-cure process of tire and tube manufacture, L. A. Laursen of Eau Claire, Wis., and Akron, must allow Henry L. Lowe also of Eau Claire one fifth interest in all royalties accruing to Laursen on his contracts, according to a decision rendered June 10 by Judge C. D. Westenhaver of the U. S. District Court of Cleveland. Laursen has contracts with the Goodyear, Goodrich, Seiberling, Ajax and other tire companies extending through fifteen years for the exclusive use of his invention. It is estimated that royalties accruing under these contracts will amount to about $4,500,000.

Lowe's suit, filed last January, was based on an agreement entered into with Laursen in 1924 when Laursen, then with the Gillette Rubber Co., of Eau Claire, perfected his water-cure process. Lowe claimed that under his agreement he was to receive one fifth interest in royalties, in return for selling the process to rubber companies. Laursen claimed the agreement terminated shortly after it was made. Counsel for Lowe claimed in court that Laursen's royalties were now averaging $5,000 a week. The court upheld the agreement.

WISCONSIN COMPANY TO MANUFACTURE NEW TIRE

The Latex Tire Co., of Fond du Lac, Wis., has contracted for the exclusive manufacturing rights to a new air-cooled demountable cushion tire, according to Orlando J. Koll, president of the company. The agreement is made with the Transverse Tire Co., of Chicago, and covers a period of five years.

Additional machinery has been ordered by the Latex company for the manufacture of the tire, and as soon as this has been installed, production will start on a definite schedule. The new tire was invented by W. O. Dayton of Chicago, who will control the sales. The Latex company will only manufacture the tire under the agreement. The tire will be used on trucks and light delivery cars. Its outstanding features are corrugated air-cooled holes.

Albert Purchases Equipment

The complete line of tire machinery and equipment of the New England Tire & Rubber Company of Holyoke, Mass., was recently purchased by L. Albert & Son, Inc., Trenton, N. J. The machinery included mills, calenders, vulcanizers, tubers, bias cutter, hydraulic presses, pumps, tire building machines, molds, calender shells, tube mandrels, etc. The same machinery dealers have also obtained the equipment of the Jack Tire & Rubber Co., Spokane, Washington, and the Metholoid Co., Rutherford, N. J.

1 - That's All

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Further particulars may be obtained from

JOSIAH CANTER
40 West 23rd Street, New York City

We have just purchased the machinery and equipment of the

NEW ENGLAND TIRE & RUBBER CO.

of Holyoke, Mass. The machinery is still on original foundations and is of very latest type, and consists of —

60″ Farrel Mill line consisting of three heavy duty Mills, with SYNCHRONOUS MOTOR;
24″ x 66″ Farrel Calender, Drive and Motor;
Quick Opening Door Hydraulic Vulcanizers with 18″ rams;
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Royle Perfected Tubers with Drives and Motors;
80″ Birmingham Bias Cutter;
Hydraulic Presses;
Accumulators — Pumps — Centrifugals;
Banner Building Machines;
63″ Textile four drum Dryer;
All size Calender Shells, Tube Mandrels, Gears etc.

We have also purchased the machinery and equipment of the JACK TIRE & RUBBER COMPANY of Spokane, Washington as well as the METHOLOID COMPANY of Rutherford, N. J.

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6. Does not produce a soft or logy product.
7. Acts like an antioxidant and produces goods which age well.
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Send for liberal working sample.

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[EDW. MAURER, PRES.]
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THERMOID EMPLOYEES GET GROUP INSURANCE

The Thermoid Rubber Co., of Trenton, N. J., through a contract with the Metropolitan Life Insurance Co., has adopted a cooperative group insurance program for its employees providing more than $600,000. The plan includes several features in addition to the actual protection established. The cooperative arrangement under which the employer and employees share the cost, enables the workers to obtain the insurance at a low rate. Each employee in the main classification received $1,000 insurance. Senior salesmen, foremen, members of the supervisory force and executives are insured for larger amounts.

MARSHALL GETS PATENT ON ALL-RUBBER CASING

A patent has been issued to T. C. Marshall of Akron to cover a tire casing made wholly of rubber without fabric of any sort. The application for the patent was made by Mr. Marshall in 1922 but the first examiners refused to agree with his claims and he was forced to appeal. He has now received a reversal of the examiner's decision with respect to the most important of his claims.

The invention covers a special method of tire construction. The tire is built up of plies of rubber stock which have been partially cured. The surface of each ply is marked lightly with grooves and when the plies are assembled, the grooves cross obliquely just as plies of cord fabric are laid alternately on a bias. In this grooving of the surfaces of the rubber sheets, the cord fabric ordinarily employed is simulated and certain advantages inherent in cord fabric are retained whil objectionable characteristics are obviated.

Makes Largest Rubber Heel

A rubber heel measuring 10½ inches by 12 inches and weighing four pounds has been manufactured by the P. & B. Rubber Manufacturing Co., Inc., of Laurel Hill, Long Island, N. Y. The company has distributed several thousand of these heels, which are perhaps the largest ever made, among wholesale jobbers throughout New York and the country.

Samson Gets State Contract

For the third successive year the Samson Tire & Rubber Co., of Los Angeles, Calif., has been awarded the exclusive yearly contract on all pneumatic tires and tubes used on the passenger cars and trucks operated by the State of California, making in all five years that Samson has served the state in this capacity since California began to award contracts for tires.

NEW DILL VALVE TOOL NOW READY FOR MARKET

The Dill Manufacturing Company of Cleveland has put on the market a new valve tool which they describe as "four tools in one." The device can be used for removing or inserting valve insides, rethreading the inside or outside of the valve stem and deflating the inner tube. It differs from other tools of the kind in that all of the individual parts are contained in one case, the diameter of which is about that of a half-dollar and the thickness about three times as great. Because of the size and shape, the tool is easily carried, a feature which appeals to car owners. The retail price is fifty cents.

Choate with Murray Rubber

F. P. Choate, for fifteen years associated with the Sears, Roebuck Co., of Chicago, has become vice-president of the Murray Rubber Co., of Trenton, N. J. manufacturers of tires and tubes and mechanical rubber goods. Mr. Choate will have charge of sales.

Niacet Chemicals

The Niacet Chemicals Corporation, whose factory is at Niagara Falls, N. Y., is offering a line of synthetic, organic chemicals to manufacturers of rubber accelerators and anti-oxidants. These include acetaldehyde, paraldehyde, aldol and crotonaldehyde. The company announces that it is now shipping these chemicals in sizeable commercial quantities, including carloads, and that prompt shipment of satisfactory quality can be guaranteed. The Roessler & Hasslacher Chemical Company of New York City are the sales agents.

INVENTS RUBBER AND FABRIC AUTO SHACKLE

A new type of flexible shackle, on which patents are now pending, has been introduced by the W. F. Gammeter Co., of Cadiz, O., manufacturers of tire machine drums and calender stock shells. According to Mr. Gammeter, the object of the all rubber and fabric design of the shackle is to replace the present metal shackle on automobiles without the need of any change in the design of the car chassis or springs. The shackle is described as being fully flexible. It will eliminate the need for oiling or greasing of hinge joints and will do away with the wearing out of shackle bolts and bushings, Mr. Gammeter points out. At the same time, it is said to overcome much of the chatter and spring noises of the car.

SELL UNITED & GLOBE RUBBER FOR $118,000

The plant of the United & Globe Rubber Co., at Trenton, N. J., has passed into the hands of State Highway Commissioner Abraham Jelin and U. S. Marshal Frederick K. Schneider, both of New Brunswick, N. J. Purchase of the plant by Messrs. Jelin and Schneider occurred some time ago, but the transfer of property rights was delayed. The amount involved in the deal was $118,000. The new owners have several prospects for the plant and it is expected that it will shortly pass into the hands of manufacturers of mechanical rubber goods.

Rubber Club Holds Banquet

The Quarter Century Club of the American Rubber Co., of Cambridge, Mass., held its fifth annual dinner in the factory restaurant recently when thirteen new members were presented with membership pins. John L. Fox, president of the company, acted as toastmaster, introducing as speakers, C. S. Ching, supervisor of industrial relations, U. S. Rubber Co., E. B. Robertson, general superintendent, American Rubber Co., and J. T. Cooper, industrial relations manager, Boston Rubber Shoe Co. The club is composed of 96 employees whose service with the company numbers 25 years or more.

Becomes Purchasing Agent

A. P. House who for 14 years has been assistant purchasing agent for the American Hard Rubber Co., of New York, was appointed purchasing agent on June 1 to succeed Edward W. Lingley.

CATALPO!

Cabot's Carbon Black is Recognized throughout the World for its Uniform High Quality. Only the highest merit—all the time—would gain and maintain the world's leadership in any raw material.

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CATALPO!

RUBBER PRICES TUMBLE ON HEAVY TURNOVERS

Exchange Has Greatest Turnover In Its History, Selling 1,667 Lots While All Prices Reach Lowest Levels In Several Years—Future Movements Startling.

In the past ten days the Rubber Exchange has witnessed not only the greatest selling on a single day in the history of the Exchange, but a decline in rubber prices that at times showed losses of from 120 to 210 points. On June 9 transactions on the Exchange totaled 1,667 lots, or 4,167½ tons, a record day of sales. The previous record was 1,329 lots sold on May 25, 1926. However, this previous record was again exceeded on June 16 when 1,441 lots were sold, or 3,602½ tons.

On June 15 rubber traders threw caution to the four winds and sold the market for the severest one day decline since the post-war period. Before the Exchange closed, putting a stop to the steady stream of selling orders, prices showed losses of from 120 to 210 points. This decline, which continued on the 16th and 17th, was explained in many and varied ways. Rumors that the manufacturers' pool was liquidating, although flatly denied, by those supposed to be informed, was advanced as a reason. Also rumors of the abandonment of British restriction were advanced.

Close observers, however, said they saw nothing new in the situation other than the steadily accumulated bearish developments in the manufacturing end of the industry, aggravated by the increase in the stocks here to a new record figure, and a tottering London market.

On June 17 future movements on the Exchange were startling. December engaged in a sheer drop of 300 points at one time, from 38.10c to 35.10c and wound up with a loss of only 10 points net for the day. An advance of from 3/4d to over 1d in the early London cables was the signal for heavy buying and short covering during the morning, which sent the active months up from 60 to 90 points. October and November were the only months to wind up with a gain, closing at 10 to 20 points higher, while July closed at 10 points lower.

Prices on the Exchange for all positions appear on this page.

Greatest Rubber Shipment

The Los Angeles plant of the Goodyear Tire & Rubber Co., recently received the the largest single shipment of crude rubber that has so far entered Los Angeles harbor. The shipment consisted of nearly 1,000,000 pounds of crude rubber valued at about $400,000.

Late Stock Prices

	Last Price June 17	Last Price June 3	1927 High	1927 Low
Ajax	8⅛	9	12⅜	9
Firestone	136¼	134	136¼	117
do 6% pfd.	106¼	107	107	107½
do 7% pfd.	103½	103¼	103½	98½
Fisk	15½	16½	18¼	16
do 1st pfd.	86	87½	89	81
General	145	155	155	140
do pfd.	105	105	106	99¼
Goodrich	53⅝	55	58¾	42¾
do pfd.	99	102	103⅛	95
Goodyear Com.	46	53¾	53¼	29½
do pr. pfd.	109⅞	111¾	110½	104½
do pfd.	112	114½	117	98½
Hood	—	—	47	42½
India	25	25	30	28
Intercontinental	11¾	12⅞	15¾	11½
Kelly Springfield	19⅝	21⅞	24¾	9½
do 1st pfd.	—	—	70	44
do 8% pfd.	—	65	70½	35
Lee	8	8½	9	7
Miller	34	34¼	36⅞	32
do pfd.	100¾	—	104	100
Mohawk	—	—	25	15
do pfd.	—	—	65	65
Seiberling	26	26¾	29	21⅜
do pfd.	100½	100	100½	96
Star	—	—	2	2
U. S. Rubber	38	47⅜	67⅛	38
do pfd.	87	101	111¼	87
U. S. Rubber Reclaiming	—	—	12	12
do pfd.	—	—	87	87

Peerless Buys Oak Tire

The Peerless Rubber Co., Ltd., has bought out the Oak Tire & Rubber Company's plant located at Oakville, Ont., half way beteen Toronto and Hamilton. The syndicate financing the deal is composed of Hamilton, Toronto and Baltimore, Md., capitalists. The former president of the Oak Tire company, Frank Law, will take active part in the administrative work. J. A. Martineau, formerly advertising manager of the Goodyear Tire & Rubber Co., becomes secretary-treasurer, and assistant general manager of the new company.

The plant, it is reported, will have a daily capacity of 500 tires and 750 tubes a day. A new patent rubber heel will also be turned out by the company in addition to rubber tiling and other rubber products.

U. S. RUBBER STOCKS SELLING AT NEW LOW

The U. S. Rubber Co., seems to be undergoing a period of hard times. After the disappointing showing in 1926, when actual earnings were only sufficient to cover the dividend requirement on the $65,110,000 8% preferred stock, this company is reported to have suffered a deficit of about $3,000,000 before preferred dividend requirements in the first five months of this year. The company's securities have declined with its earnings. On June 17 U. S. Rubber first preferred was selling at 87 which is 24¼ points below the 1927 high, while common was selling at 38, or 29⅛ points under the year's high. Nevertheless, despite the declining prices on the company's securities, it is generally believed that it will declare the regular quarterly dividend of $2 on the first preferred stock on July 7.

Other rubber stocks have remained steady in the last ten days, with only Firestone and Seiberling reaching new highs. Firestone common touched 136¼ on June 17, a new high, and both 6% and 7% preferred made new levels. Seiberling Rubber gained a new high on a half point, preferred securities selling 100½ on June 17.

Auto Output Lower

Production of automobiles in the United States in June is expected to show a sharp drop on account of the fact that the Ford Motor Company is said to be out of production of complete cars entirely in anticipation of the new Ford which will replace the Model T. Only parts have been turned out by Ford during June; the manufacture of parts for the Model T cars is to continue for five years according to an announcement.

Throughout the industry generally automobile sales and production has been about ten per cent lower in 1927 than in 1926.

Closing Prices on Rubber Exchange of New York, Inc.

JUNE 4 TO JUNE 17

	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	SALES*
June 4	39.70	40.00	40.10	40.20	40.30	40.60	40.80	41.10	41.40	41.70	41.90	42.10	109
6	39.40	39.40	39.60	39.90	40.00	40.10	40.50	40.50	40.80	41.10	41.40	41.70	487
7	39.20	39.40	39.40	39.80	39.90	40.10	40.40	40.50	40.80	41.10	41.40	41.70	669
8	38.80	38.90	39.00	39.10	39.20	39.30	39.60	39.80	40.10	40.30	40.50	40.70	694
9	38.80	38.90	39.00	39.10	39.20	39.30	39.60	39.80	40.10	40.30	40.50	40.70	1,667
10	37.40	37.60	37.60	37.70	37.80	38.00	38.10	38.40	38.60	38.80	39.00	39.20	1,106
11	37.50	37.70	37.70	38.00	38.10	38.30	38.40	38.70	38.90	39.10	39.30	39.50	36
13	37.10	37.30	37.30	37.50	37.60	37.70	38.00	38.10	38.30	38.40	38.60	38.80	432
14	36.70	36.80	36.90	37.00	37.00	37.20	37.30	37.50	37.70	37.90	38.10	38.30	771
15	35.10	35.00	35.10	35.20	35.20	35.30	35.40	35.60	35.70	35.80	35.90	36.00	1,122
16	35.40	35.40	35.40	35.50	35.60	35.70	35.90	36.10	36.20	36.40	36.40	36.50	1,441
17	35.20	35.30	35.40	35.50	35.80	35.80	35.80	35.90	36.10	36.30	36.40	36.50	1,043

(*) In lots of 2½ tons each; totals are for old and new contracts. (Prices are for new contracts)

Rubber Products Committee

The Rubber Products Committee D-11 of the American Society for Testing Materials has held two meetings in the past year in addition to the annual meeting held at Akron on October 13, 1926 and at Philadelphia March 17, 1927. This committee has just issued a report which was read at the 30th Annual Meeting held at French Lick, Ind., June 20 to 24. The report proposes revisions on three standard specifications, first for rubber belting for power transmission, second for rubber pump valves and third, standard specifications for adhesive tape. No new specifications are being presented this year by the committee. One new sub-committee has been organized, namely a sub-committee on Rubber Products Designed to Absorb Vibratory Shocks. The following resolution was adopted to guide Committee D-11 in its future activities: "Resolved, that the efforts of Committee D-11 be devoted mainly to the study of modern methods of test in their application to various rubber products, with a view of formulating 'standard methods' of test and the promotion of their use in the industry".

Noah Van Cleef Returns

Noah Van Cleef, president of Van Cleef Brothers, rubber cement manufacturers of Chicago, returned on the *Olympic* on June 14 from a trip to Europe.

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RUBBER INDUSTRY TAKES MOST OF CARBON BLACK

About two-thirds of the total output of carbon black is now used in rubber goods to increase tensile strength and reduce oxidation, according to a recent bulletin of the Bureau of Mines. The next important uses for carbon black are in ink and paints. It is also used in other miscellaneous products such as stove polish, crayons, cement, paper and composition goods.

Carbon black is a fluffy, velvety black pigment made by burning natural gas with insufficient air. Although it has been in use for about fifty years, its value to the rubber industry was not recognized until about 1915; previously its principal use had been in inks. Today carbon black comprises about 10 per cent of the weight of automobile tires in service.

The production of carbon black is now approximately 200,000,000 pounds per year. In 1925, the last year for which statistics are available, 177,417,000 pounds were produced. Since 1923 production has constantly exceeded the demand although in previous years a greater quantity would have been used if it had been available. Exports of carbon black have been important since 1923, more than 39,000,000 pounds being shipped abroad in 1926 with a declared value of $3,622,000.

Mexican Rubber Heels

The El Popo rubber factory of Mexico City, Mexico, is increasing its production of rubber heels since the new import duty of March 7 has made the importation of American heels much more difficult, according to the American Commercial Attache at Mexico City. El Popo also manufactures canvas rubber-soled footwear.

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U. S. LEADING WORLD IN EXPORT OF CASINGS

In the first quarter of this year the United States took first position as the leading exporting country of automobile casings, reducing its nearest competitor, France, to second place, Canada to third, and the United Kingdom to fourth place. Of the world total of tire exports, the United States furnished 33%, France 31%, Canada 23% and the United Kingdom 13%. In the first quarter of 1926, France was the leading exporter of casings, supplying 35%, while the United States stood second with 30%, Canada with 22% and the United Kingdom with 13%.

According to the rubber division of the Department of Commerce, from which these figures are obtained the total exports of casings for the first quarter of 1927 amounted to 2,100,000 units. This represents an increase of more than 50% over exports in the corresponding period last year from the above-mentioned countries. The number of casing units exported from the United States during the first three months of this year totaled 706,574, as compared with 418,287 units in the corresponding period of 1926. Shipments from France totaled 655,040 as against 494,502 in the first three months of 1926, while the exports from Canada amounted to 498,422 units as compared with the same period in 1926. The United Kingdom exported 285,124 units in the first three months of this year which compares with 191,095 in the corresponding period of 1926.

Install New Machinery

The National Tire & Rubber Co., of East Palestine, O., is reported to be doubling their vulcanizing capacity by the installation of new machinery. While the installation is in progress, tire and tube production however, has been temporarily curtailed. The plant is producing about 800 tires a day, but as each new unit is put in place the production schedule is increased, and it is expected that the factory will be producing in the neighborhood of 2,000 a day when all new machinery is in operation.

Columbus Tire Has Meeting

The Columbia Tire & Rubber Co., of Columbus, O., held its first annual sales meeting on June 9 and 10 at the plant where representatives from all parts of the country gathered to hear addresses by the officers of the company, and to inspect the factory.

Hood Defers Common

The first break in the common stock dividend record of the Hood Rubber Co., of Boston since 1898 occurred June 15 when the company passed the regular quarterly dividend of $1 a share on the common stock. Last fall a stock dividend of 25% was paid. During the post-war deflation period the Hood company was the only large rubber manufacturer to maintain common stock dividends.

New Racine Rubber Company

The Horseshoe Tire & Rubber Co., subsidiary to the Racine Horseshoe Tire Co., has recently been organized. The articles of organization show that the company will deal in automobile tires and rubber products in general.

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New Equipment for Rubber Factories

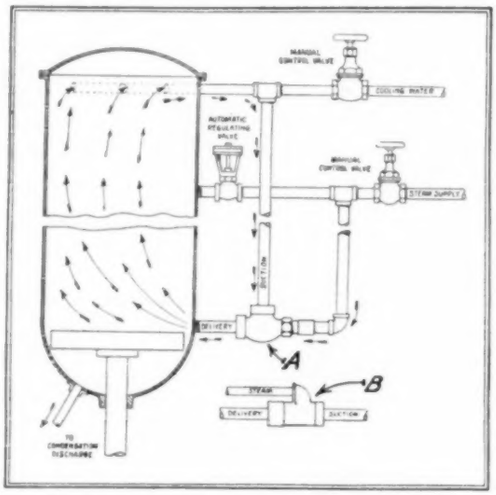
Power Stand and Buffer

A new machine which has been used as a tire buffer and power stand has just been placed on the market by De Mattia Brothers, Inc., of Clifton, N. J. The illustration shows the machine in use buffing tires for retreading. It is used in the same manner for buffing air bags for recovering. The buffing attachment is mounted on swivel brackets and is operated by a 1½ hp. motor. The buffing wheel is made up of inexpensive sectional cutters, which are said to be exceptionally easy to regrind or replace.

When the buffing attachment is not in use, it may be swung back and the machine used as a power stand for building. The 2″ spindle has two speeds and is mounted on ball bearings and driven through reduction gears and multiple disc clutch, operating in oil. The motor is 1 hp., controlled by an oil reversing switch.

De Mattia Power Stand and Buffer

MAINTAINING STEAM CIRCULATION IN TIRE HEATERS



The accompanying diagram illustrates a modern installation, including suitably designed steam jet apparatus on the ejector principle, for producing and maintaining steam circulation in tire heaters to prevent the formation of air pockets and the resultant undercures.

Either of the two types of ejectors shown at A and B in the illustration can be used in such applications. The ejector is piped up to the heater as follows:

The suction connection is piped into some point near the top of the heater. In heater installations where top cooling water supply pipe is used this connection can be made as shown in the drawing. The delivery connection is piped into the heater at any point near the bottom.

The steam connection is piped into the heater, the ejector can discharge into the manual control valve and the automatic control valve, as shown. When the heater is in operation the action is as follows: The steam supply to the ejector being always higher than the pressure in the heater steam supply line, between the heater, thus creating a partial vacuum on the suction side of the ejector. This produces a constant circulation from the top to the bottom of the heater, and this in turn prevents the formation of air pockets at any point in the heater. It is, of course, practically impossible to prevent the presence of air in the heater due to the fact that air is trapped in the heater when it is closed and also due to the leakage of the air bag connections. In the absence of any positive circulation this air may cause an air pocket at any point in the heater and due to its insulating effect will cause an under-cure.

According to the manufacturers the steam used to create this cirulation does not constitute an additional expense since it is discharged directly into the heater. They also state that the orifice in the steam nozzle of the ejector must be of such size that it will discharge less steam than the minimum required by the heater. If this is not the case, the automatic steam control valve will not function. (Ohio Injector Co., Wadsworth, Ohio.)

RUBBER PUMP LINING SAVES ABRASIVE WEAR

The Byron Jackson Pump Manufacturing Company of Berkeley, California, has placed on the market several models of rubber-lined pumps for handling water laden with sand, slime or other abrasive materials. Before adopting rubber the company attempted to overcome the excessive wear incurred in such service by using harder metals than ordinary cast iron. It was found, however, that the wear was almost as great as if the cast iron had been used.

Since a greater use of rubber was being made in commercial services the Byron Jackson company decided to try rubber-lining their pumps. A layer of hard rubber is molded to the metal surfaces and there is vulcanized thereon a layer of soft rubber. The tough, resilient surface has been found to wear scarcely at all as huge quantities of sand or slime are handled. The impeller of the pump is rubber covered as are certain other parts.

Tennis Shoe Exports

The United States is now exporting canvas rubber-soled footwear to all parts of the world and the trade is flourishing in the present season. Canada, England and France are also exporters of this item but the quantities they ship are much smaller than the exports from the United States.

Auction Tucker Rubber Co.

Through an order of Federal Judge John R. Hazel, the property of the Tucker Rubber Co., of Buffalo, N. Y., was auctioned on June 21. The company has a deficit of $422,168, according to an audit of the company's accounts recently made. Total unsecured claims are $458,735 which are offset by assets with a realizable value of $36,567. The receivers of the company, John H. Kelly and Edward N. Wilkes, have on deposit to their credit $19,786 of which $16,040 was obtained from the sale of finished and unfinished merchandise and raw materials stored in the plant of the New York Rubber Co., of Beacon, N. Y., a former subsidiary.

GENERAL MOTOR SALES REACH 727,952 CARS

In the first five months of this year General Motors sales to dealers totaled 727,952 cars and trucks, which compared with 524,707 in the corresponding period of 1926, or 203,245 units less than in the current year. This year's sales were more than double the 318,121 units sold in the first five months of 1925. At present there are no signs of an abatement in the demand for General Motors products and some observers are predicting earnings for the last half of the year closely approximating the estimate for the first half. This progress warrants the belief that General Motors may pay another stock dividend on its common this year.

On the basis of the company's current quotation and its earning ability a 100% stock dividend would seem conservative. This would bring the price for the new stock based on present market quotations to around 100. Estimates of the company's profits in the first half of the current year are being revised upward in view of the excellent sales record made during the second quarter. As against earlier estimates of $120,000,000 net for the common in the first six months of 1927, the revised estimates now place earnings for the period at around $125,000,000 to $130,000,000, which would equal $14.50 to $15 a share on the 8,700,000 shares of General Motors common now standing.

Retail sales of General Motors cars by the corporation's dealers to consumers in May were 171,364, an increase of 29,713 cars, or over 20% compared with the corresponding period last year, and a new record for the month. April retail sales were 180,106.

Geer at Goodrich Plant

The B. F. Goodrich Co. of Akron was host to W. C. Geer and a group of chemical engineers who came to visit the plant from Cleveland where they had been attending the 19th semi-annual session of the American Institute of Chemical Engineers. Addresses were made by J. D. Tew, a member of the Goodrich board of directors, and H. F. Fritz. W. C. Geer was formerly vice-president in charge of research of the B. F. Goodrich Co. He is now engaged in writing and research.

Will Construct Addition

The National Metal & Rubber Co., of Boston, Mass., is making preparations for the erection of a new one-story addition to its plant. The estimated cost of the proposed building is $37,000, including equipment.

Chemical Engineers Meet

The 19th semi-annual session of the American Institute of Chemical Engineers was held in Cleveland, O., in the early part of June. One meeting was given over to the discussion of rubber. W. C. Geer, former vice-president in charge of research for the B. F. Goodrich Co., presided at the meeting. Papers were read by W. F. Zimmerli, Akron consulting chemist, J. W. Schade, Jr., chemical engineer of the Goodrich company, J. R. Silver, Jr., of the New Jersey Zinc Co., R. P. Dinsmore and W. K. Lewis.

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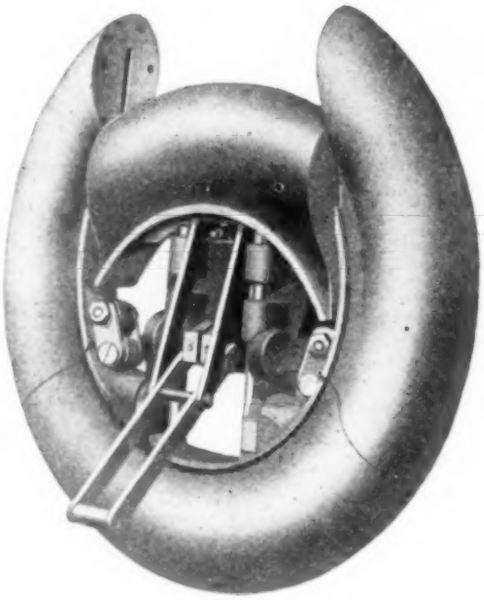

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Fisk Building, 250 West 57th St., New York, N. Y.
Telephone—Columbus 6430-31-32

P. L. PALMERTON — President and Editor

Published on the 10th and 25th of each month by Palmerton Publishing Co., 250 West 57th St., N. Y. C. and Highland N. Y. Address correspondence to N. Y. office.

Subscription rates: Domestic, $2.00; Canada, $2.50; Foreign, $3.00. Single Copies, 20c.

Entered as Second Class Matter, June 10, 1920, at the Post Office at Highland, N. Y. under Act of March 3, 1879.

Forms close 10 days before publication date. If advertising proofs are desired, two weeks should be allowed. Advertising rates on application.

Vol. 21 JUNE 25, 1927 No. 6

Lower Rubber Prices

WITHOUT WARNING, the rubber market experienced a sharp break in prices in the last fortnight and the Rubber Exchange of New York established a new trading record. One crude rubber house says that the break "can be attributed to a number of uncertainties such as the fear of a general tire price reduction, persistent rumors that the British will abandon restriction, and indications that the manufacture of automobiles is slowing up". All of these causes culminated in a general selling movement, both on the part of holders and "bear" operators, which immediately carried prices downward several cents per pound.

One factor which is credited with having influenced the selling wave, and which is not listed above, concerns speculators who bought rubber when it had become apparent that the exportable percentage under the British rubber restriction scheme would be cut down to 60 per cent in the quarter beginning May 1. Since it was expected quite generally that such a reduction would be followed by a gradual but consistent strengthening of prices, the willingness of operators to take a little flyer in rubber is not surprising. But when the market showed no new strength after the expected revision in the scheme had been made, but even softened somewhat, the decision of the operators to shift to lower ground is likewise not surprising.

What the British can or will do with the restriction is impossible to predict. It is certain that having maintained the system for five years, it will not be easy for them to throw it overboard. The rumors of its complete and immediate abandonment are given greater credence than they deserve. Some revision of the present regulations may be expected on November 1, or even the announcement of some scheme for the gradual retirement of restriction, but how any sweeping abolition of the entire system is possible is difficult to understand. A little study as to what depths rubber prices would reach with all control abandoned is enough to make one consider it impractical. The results would be as severe for the producers as for the consumers.

During the five years in which restriction has operated, the supply of rubber from unrestricted regions has steadily increased and the world has learned to use substitutes in an acceptable manner. The result is that the world receives almost enough rubber when the British colonies are shipping only 60 to 70 per cent of what they could produce. Hence, they will perhaps have to remain on a restricted basis for an uncomfortably long time. Within a few years the world's need for rubber will have increased enough to make the present pivotal price also an economic one at which point abandonment of restriction would be both logical and easy. Whether the planters will be willing to wait so long a time remains to be seen. One of the penalties of having embraced restriction is the difficulty of letting it go whenever desired.

So long as restriction is maintained, rubber prices are apt to experience sharp and unforeseen movements which reflect no change in demand and supply.

Tax Reduction

THE RECENT announcement that the Federal government will have a surplus of almost $600,000,000 in its present fiscal year gives point to the predictions that taxes will be slashed again at the next session of Congress. The industries of the country will have special interest in such a change since it appears to be more or less agreed that corporation taxes will be given early attention when the rates are being reduced. The rubber industry in particular will be glad for any change which lessens its burden of disbursements.

Taxes have taken a greater part of the net income of American corporations than has been generally understood. A compilation of the National Industrial Conference Board, representing all American industries, has revealed that in 1924 no less than 36 cents out of every dollar of the combined net income of all incorporated business concerns in the United States were absorbed by the tax levies of the Federal, state or local governments. The great weight of this tax burden is due in large part to the World War but it is a fact that it has become heavier rather than lighter as time has passed. For instance, in 1923 the comparative allotment for tax purposes was only 27.7 cents out of each dollar of net income. A reduction in the percentage which must be paid to the Federal government will be welcomed and rubber corporations will be watching closely after the new Congress convenes for downward revision of the corporation levy.

Honorable Mention

ACCORDING TO the advertisements, so many industries and companies had the honor of supplying Lindbergh with absolutely trustworthy equipment that the success of his flight is no longer surprising. The whole cannot fail, of course, where all the parts are infallible. But is rubber to have no part in the triumph, outside of the Silvertown tires which bounced him off the Roosevelt runway and the hard rubber Waterman pen which he found "most precious"? The aeronautical engineer who supervised the building of the Spirit of St. Louis replies affirmatively. "There was one thing Lindbergh had to look out for", says the engineer, "and that was a feed line that was infallible. He got it by floating the line in rubber"!

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The Problem of Removing Dust in Rubber Factories

Old Fashioned System of Sweeping With Brooms Is Being Replaced In Rubber Factories With Pneumatic Sweepers

DUST, WHICH is an unpleasant element in the home, is also a dangerous and expensive one in the factory. In her fight against this evil, the housewife has largely abandoned the broom and dust-cloth in favor of the vacuum cleaner which disposes of the dust more quickly and efficiently. To an increasing extent industrial plant managers are following her lead and are installing pneumatic sweeping systems to meet their complicated cleaning problems. Among these concerns

Cleaning a Floor with a Pneumatic Sweeper in the B. F. Goodrich Factory at Akron.

are found many rubber companies such as the Firestone Tire & Rubber Co., the Manhattan Rubber Co., the New York Belting & Packing Co., B. F. Goodrich Co., and the Philadelphia Rubber Works Co.

Everyone who has visited a dirty factory has noticed the thick accumulation of dust on beams, pipes, shelves and walls. Some plants, according to their nature, suffer more from the dust evil than do others. Rubber factories, particularily in the mill rooms, have a distinct dust menace. To clean a dirty factory with brooms is merely to stir up the dust and have a good part of it settle somewhere else. To clean a plant effectively the dust should be picked up with as little disturbance as possible and carried away. It is on this general principle that the success of the pneumatic sweeper has been founded.

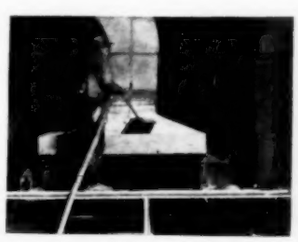
A dusty, dirty plant is apt to produce an inferior article at an increased cost. This is due to both the human element and to the effect that dust has on mechanical equipment. Both the man and the machine are sensitive to dirt. There are certain kinds of dust that are poisonous, especially in the occupations of miners, stonecutters, glass-workers, potters and metal grinders. Dust bearing lead or arsenic is poisonous, as is rock dust containing silica which is produced in grinding or polishing operations. Happily, the effects of breathing the dust commonly encountered in rubber plants are not so serious but they are eventually harmful to the workers' health and decrease their day-to-day efficiency.

Any dust inhaled into the respiratory passages or lungs can be considered harmful even though it may not be especially dangerous. A very small amount of dust in the air can be tolerated by the human body, mainly because it has means in the respiratory passages for intercepting much of the dust before it reaches the lungs. However, a certain amount of dust does get into the lungs and the body has a limited capacity for removing such particles. When this capacity is exceeded, the lungs become gradually charged with the dust. It has been found that the particles most damaging to the lungs are those of one micron in diameter which are only visible to the eye through the aid of a powerful microscope. About 50 placed in line would be needed to equal the diameter of a human hair. Nevertheless, small though these particles are, they can cause irreparable damage to the system.

The ill effects of dust on the human body are duplicated in the case of the factory machinery. The wearing and abrasive effects of dust and grit on journals has brought about the sealed bearing, and nearly all electrical apparatus will not operate properly in dust. A motor must frequently be cleaned to prevent a breakdown in the insulation, and in a steel mill, where dust contains metallic particles, it will ruin control apparatus. When this dust collects in only a small amount on a switchboard, a breakdown is inevitable. Dust in an industrial plant increases the fire hazard and it is, of course, common knowledge that large collections of dust of certain kinds may cause violent explosions.

It is obvious that with such an ever-present menace as dust in the factory, any system which would effectu-

The View to the Right Shows Talc Dust Being Removed from a Ventilator Hood in the B. F. Goodrich Factory by Means of a Pneumatic Sweeper.



The View to the Left Shows the Stationary Pneumatic Sweeping System as Installed in a Rubber Factory.

ally eradicate this evil would appeal to the plant executive. The idea embodied in the small home vacuum cleaner has been incorporated in a much larger and rugged machine which has been successfully employed in cleaning the industrial plant from all dust accumulation. These machines are known as pneumatic sweepers, as distinguished from the vacuum cleaners used at home. The pneumatic sweepers are adaptable to large buildings, such as factories, schools, hospitals, churches and office buildings. Their application is not limited to floors having covering of one sort or another; they are used in many different ways in industrial plants, as the accompanying illustrations show. One company manufacturing pneumatic sweepers is the Allen & Billmyre Co., whose product is known as the Tabco Exidust Cleaning System. This company has installed pneumatic sweepers in a number of rubber manufacturing plants.

These pneumatic sweeping systems are generally of two types, portable and stationary. In the case of the former, the complete machine is mounted on a truck which can be pulled from room to room or from one section of the plant to another. In the stationary type, the motor, exhausters and dust separators, which constitute the main features of the system, exclusive of hose and nozzle, are permanently located in some central or convenient section of the plant and a system of piping is installed with hose connection valves placed at appropriate points. As in the case of the household vacuum cleaners, the industrial sweepers have every kind of nozzle necessary for all types of cleaning. Walls may be cleaned, and out of the way places in the dark corners of the boiler room reached without trouble.

Obviously the velocity of the air sucked through the nozzles of these pneumatic sweepers is many times that of the vacuum cleaner of the home type. In order to carry away the extremely heavy dust, or dirt that accumulates in a factory, a wind of almost cyclonic force must be forced through the hose and pipe lines. The chief factor of efficiency in any pneumatic sweeper is that of the air or wind velocity, and this factor, in turn, is to a large extent governed by the degree of vacuum maintained, as well as by the volumetric exhaustion capacity of the vacuum producer.

The Marketing of Rubber Footwear Seconds

Problem Is A More Difficult One Than In The Tire Industry—Punch Holes Identify Defective Goods

THE PROBLEM of "seconds" in the manufacture and distribution of rubber footwear is of major importance in that branch of the industry, much more so than it is in tires, for instance. Present day methods of building and curing the cord tire have reduced the hazard of producing "seconds" to a minimum, and the few imperfect tires which are produced (generally less than one per cent of production) are absorbed by the regular distribution channels without disturbing the sale of perfect merchandise in the slightest degree.

With footwear, however, the case is far from parallel. In the first place, the product is not moulded but cured in the open heat, and subject to blisters, separations, and various classes of damage inevitable in handling a small article. Furthermore it is still a hand built product and as such is subject to the vagaries of the endeavor of human hands. For no more than four to five per cent of the production to be classed as seconds is regarded as a good record in a rubber footwear plant.

As soon as the shoes are trimmed after vulcanization and removed from the lasts, they are laid out on the packing tables for inspection and grading. Taking up a pair of rubbers, the inspector first examines them to see that they are mates and the same size. The sole is examined for blisters and the edge is inspected to see if it is rolled in tight to the upper. The upper is examined for pin-holes, blisters or other imperfections, and the heel and toe are checked to see if all the parts such as toe tip and heel tip are in place. Then the edge of the bind is observed to make sure that it has not been cut in trimming, and the lining and insole are inspected for varnish stains, cement blotches, or imperfections in the fabric. The inspector then completes his inspection by stamping the insole with his initial.

If a shoe is classed as a 'second', a tiny hole is punched in the back; if it is classed as a 'third', two holes are punched.

Obviously, with the five per cent of the rubber footwear production being punched as seconds and thirds, the distribution of seconds must be planned carefully or the regular markets are spoiled. This is specially true of extra quality brands not sold in the ordinary chain stores or small shops. The manufacturer must be careful that the special extra quality brands which sell for a high price on the de luxe shop of Main Street are not offered in seconds at the cobbler shop round the corner, for the latter will probably omit to describe the goods as 'seconds' and the regular public does not know about the little punch hole.

The smaller footwear companies usually try to keep their seconds out of the territories where their regular goods are handled except in the case of their regular customers who have the privilege of buying so many cases of seconds with each order for firsts as a weapon to meet cut price competition. They also avoid disposing of their seconds to a jobber who is apt to peddle them out in competition with the company's regular merchandise. In the large cities bargain-basements furnish a big outlet for seconds and do not hurt the out of town distribution.

From this it can be seen that the shoe manufacturer has no trouble in disposing of his seconds, although he has to be very careful of how he disposes of them.

Effect of Car Design on Front Tire Wear

J. E. Hale of the Firestone Tire and Rubber Company read a paper entitled "Tread Wear on Front Wheels as Affected by Camber, Toe-in and Steering Geometry" before the S. A. E. meeting at French Lick, Indiana, on May 26. Mr. Hale's paper draws comparisons in the difference of tread wear between front and rear tires. Assuming the wear which is observed on rear tires to be what is classified as natural wear, the peculiarities in wear observed occasionally on front tires are due to the mechanism of the car embodied in camber, toe-in and steering geometry elements.

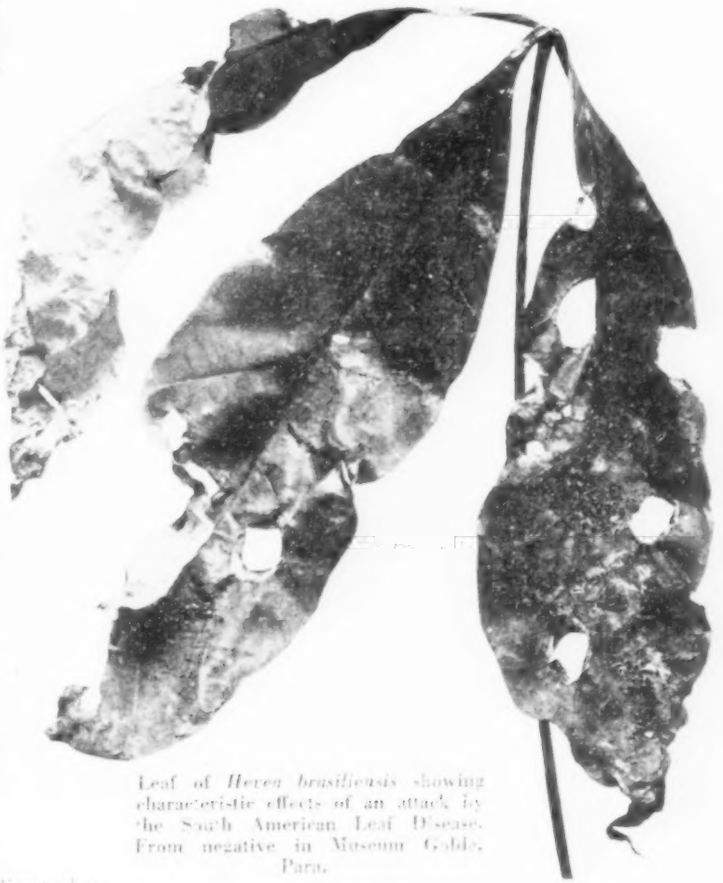
How these elements are responsible is discussed by Mr. Hale and an argument is developed advocating the elimination of toe-in and camber and more correct steering geometry. A hint is dropped that these features of car design haven't had a great deal of attention in the past and a plea is built up urging that the cars not only be engineered properly in the future, but service facilities be provided to restore the car by proper adjustments so that lateral scuffing effects from toe-in, camber and wheel geometry components are eliminated.

The South American Leaf Disease of Hevea and Its Control

Conditions of Climate And Soil Are Factors In The Spread of The Disease

By James R. Weir

Pathologist, Rubber Research Institute of Malaya



Leaf of *Hevea brasiliensis* showing characteristic effects of an attack by the South American Leaf Disease. From negative in Museum Goldi, Para.

THE LIMITATION of space in a general report such as the writer has recently prepared on the pathology of the Para rubber tree in the Amazon Valley[1] necessarily restricts the discussion of any one aspect of the subject. For this reason, it may be of interest to discuss further the South American leaf disease with special reference to its control. The fact that the fungus causing the disease is endemic does not necessarily mean that it is a serious menace to rubber growing. Far more is the disease to be feared in other parts of the tropical world which have a similar climate but where conditions of temperature and humidity are possibly more suitable for its propagation than in its original home.

Imported Diseases Most Destructive

The history of many plant diseases that have become epidemic shows that those which have been more destructive, or most difficult of eradication or control, are such as have been introduced from other regions or countries. This may be due to several factors. The original host may occur in greater quantity in the new locality, a new and more susceptible host may be present, or it may occur in pure stands thus enabling the fungus to spread more rapidly and become more thoroughly established, and finally, climatic changes may be more favorable to the production and dissemination of reproductive bodies and infection.

It is undoubtedly true that the virulence of a plant parasite may be intensified by a more favorable climate, viz.: there may occur a particular temperature and moisture relationship which is favorable to a more abundant production of spores and its early stages of development as regards establishing relations with its host. Again, the host with which the parasite has been always associated in its original home may have developed a certain amount of resistance or immunity so that when a new and more susceptible host is encountered the parasite spreads rapidly. The above condition may be abundantly illustrated by the history of some of the most serious epidemic diseases of plants that have been introduced into the United States.

Less frequently do we find a fungus parasite becoming epidemic in the region in which it is indigenous. When this occurs it is usually a case in which a susceptible new host has been brought in contact with the parasite or a local host established under quantity production without regard to local conditions most favorable to the fungus. Sometimes lack of experience with the crop, either old or new, in the region accounts for failure. Be this as it may, it is an expensive means of obtaining information and illustrates only too well the truth of the old adage that experience is a dear teacher. In the writer's opinion this method of instruction should not be necessary with regard to the future developments in rubber in the American tropics.

Environment Must Be Studied

The influence of local environmental changes like that between regions widely separated may be of sufficient importance to furnish the basis for successful crop production and disease control, when intelligently interpreted. Such conditions may be abundantly utilized preparatory to developments in any plantation crop.

Contrary to the usual conception, the Amazon Valley drainage is a region with considerable topographical variation. In this great region, with its numerous streams, any variation in topography naturally results in a considerable change in the character of the soil. The effect is to produce two general soil groups, alluvial and upland. On the character of the soil depends the maximum economic development of Hevea. Since it grows best on the high well-drained loams, we

[1] "A Pathological Survey of the Para Rubber Tree in the Amazon Valley." U. S. Department of Agriculture, 1926; reviewed in THE RUBBER AGE, Vol. 19, Page 230, 1926.

may therefore state that topography, in connection with the attendant minor changes in climate, reacts, not only on the general character and distribution of *Hevea brasiliensis*, but also on the incidence of its most important disease. For example, it was observed that the more impoverished the tree from growing in poor soil, the more susceptible it was to the effects of the leaf disease as well as to other fungi, with the reverse as true on good soils.

It is pretty well demonstrated that nutrition variations in the soil affecting the chemical relation between host and parasite, likewise the physical properties of the soil, are important factors in the incidence of disease. The response of Hevea to these different site conditions has resulted in well-recognized forms that are rated differently according to the quality of the rubber produced and has outlined the natural horizons and seats of greatest infection of the leaf disease.

Hevea Not Adapted to Wet Soils

To illustrate the need of careful analysis of field conditions, it may be well to recall that if the early observers of *Hevea brasiliensis* on the Amazon had given more attention to the ecology of the tree they would have been more successful with their early plantings in the East. They would have learned, for example, that the tree, although growing under a great variety of soil conditions is not primarily adapted to low wet soils but reaches its maximum development in the higher well-drained sites. The reaction of these conditions to the incidence of disease would have also been observed if the subject had been one of concern at the time.

Coming now to a more definite discussion of the factors that are apparent in the distribution of the leaf disease and to summarize what has been said before, it is the writer's opinion that the local distribution and importance of the fungus as a parasite is governed by regional variation in climate induced by topography in part with the attendant changes in soil and moisture.

Presence of Moisture Encourages Fungus

The continuous presence of moisture on the leaves for a period of ten to twelve hours, which is thought to be sufficient to effect germination of the spores of the fungus and for infection, is the apparent condition necessary for the rapid propagation of the parasite. A careful consideration, then, of the factors governing the amount of moisture in any particular region or proposed site is of the greatest importance. For example, on alluvial lands subject to periodic inundations the atmospheric humidity is more uniform. This is due to greater soil moisture at all times of the year, proximity of water and the prevalence of fogs which may hang over such areas. On these lands the factor of disease assumes great importance. The leaf disease, and other fungi as well, find favorable conditions for development. The amount of humidity on such lands, though naturally fluctuating according to the seasons and the dew point, would for the above reasons preclude the selection of such lands, which are never very extensive at any one place or conveniently shaped for planting rubber. On the other hand, although the climate of the Amazon Valley may be considered in general to be fairly uniform, the amount of moisture present in the air from rain, dew, mist or fog at any time of the year in many localities of the best site conditions is apparently not sufficient even at intervals to cause an epidemic of the disease.

Compared with many tropical countries, the rainfall in the Amazon Valley is not so heavy. When it is considered that there is a long dry summer season of six months during which time rain may not fall for periods of two or three months at a time, the uplands become very dry. If, during this period, there is a heavy fall of dew the water precipitated on the leaves of plants is rapidly evaporated through the drying action of moderate winds. The winds, varying in intensity and direction in different parts of the Valley, are more or less constant throughout the year. The winds are rarely strong enough to break the trees or affect their growth. In all open spaces of any extent, especially on the uplands, a light but drying, breeze is always noticeable.

It would be expected, from what has been written about the destructiveness of the fungus, that it would be found damaging the trees in the forest, especially seedlings and trees that have not yet brought their crowns above the general forest canopy. On the contrary, the fungus was entirely absent from most of the regions visited and where it occurred, which was usually on the flood plains in the lower stretches of the Valley, the infected appeared not to have suffered any permanent ill effects. Dr. Monteiro da Costa of Para, who accompanied the investigating party of the Departments of Agriculture and Commerce, informed the writer that in natural prairies on the Marmellos in Matto Grosso, there are clumps of forest composed almost entirely of *Hevea brasiliensis* and in which he, after long association with the region, had never observed any devastation from leaf diseases.

Aside from the fact that the fungus was more frequently observed on trees growing on land subject to occasional overflows or having a high permanent water table, the absence of any permanent damaging effects by the fungus on wild Hevea gave but few clues of what was to be expected on planted rubber. A careful inspection was accordingly made of plantations whenever possible.

Small Plantings on Amazon

Numerous small plantings have been made at different points along the Amazon and its tributaries. As a rule the plantings had been made on poor soils, but that does not concern our problem as much as the fact that the trees planted in the open on the higher sites showed no evidence that they had been effected by the fungus. These plantings ranged from a few trees up to several thousand, and were of several years standing. What may be expected in plantations of large extent on optimum site conditions is impossible to predict. The fact remains however, that an examiamination of Hevea both planted and wild in localities most suitable for profitable returns and where the site conditions were such as would delay or prevent the accumulation of moisture on the leaves for protracted periods, the fungus was not found.

In contrast with this, the fungus was found in the lower Amazon region, temporarily causing more or less damage in small plantings. These plantings were on wet or water-soaked soils where the humidity was high. It is interesting to note that the leaf fungi recorded by the Department of Commerce investigators in plantations not visited by the writer and submitted to him for determination, were of different species from the one in question and in his opinion of little importance.

Choose Disease-Resistant Trees

Along with the selection of the best possible sites for plantations based upon a knowledge of the response of the tree to different soils, the grower while planting up his areas with the best selected wild stock of known high yield should immediately begin experimental work looking toward the development of disease-resistant types. This is a promising field for investigation. In the Guianas, observers have called attention to the existence of apparently immune trees in all plantations affected by the leaf disease. This condition was also observed in a small planting on low ground in the lower Amazon. Such a condition could scarcely be attributed to accident in spore dissemination, or failure of the trees to produce leaves at the same time.

Observations on *Hevea brasiliensis* in the Amazon Valley show that the tree exhibits great variability in various directions. Difference in susceptibility to the leaf disease may be sufficiently substantial as to be permanently fixed through a careful manipulation of materials. Such experiments may be rapidly brought to a conclusion because of the ease with which the species may be propagated vegetatively, thus preserving and rapidly multiplying the most promising stock. The search for resistant types should, of course, not overlook the necessity of combining in the same strain other desirable characters, viz.: quality and quantity production. This com

[Concluded on Page 300]

Rubber Solvents and How They May Be Recovered

Increased Safety of Workers May Justify the Adoption of a Solvent Recovery Process Even Though the Saving is Slight *

THE SOLVENTS which are commonly used in the rubber industry are benzene and various grades of gasoline. In addition some use is made of carbon tetrachloride and carbon bisulphide. This covers the entire rubber industry unless we consider distinct but closely allied industries such as those producing accelerators and liner dope.

Three main uses of solvents in the rubber industry are:

(1) For making rubber solutions or cements for dipping, spreading, joining rubber to metal or rubber to rubber, binding asbestos packing, decorating and general adhesive work.

(2) For freshening the surfaces of unvulcanized rubber during fabrication.

(3) For the purification of certain rubbers.

Because of the value and quantity of solvent used in the rubber industry, much effort has been expended in the rubber industry to solve the problem of solvent recovery. The problem is complicated by the hazards of fire and toxicity and the conditions of solvent utilization. Normally, at the point of ultimate utilization of the cement, dough, or other mix, the solvent evaporates into the air and there is grave danger of the formation of explosive mixtures. Effort is made to avoid this risk by ventilation so abundant that the vapor-air mixture is always below the lower explosive limit. This has the added advantage of lessening the risk of toxic effects on the workmen.

When Solvent Recovery is Impracticable

There are, however, certain risks including the possibility of the formation of localized air pockets in which vapor concentration gets up into the explosive range, from which destructive explosions may be caused by static electric discharges or other fortuitous sources of ignition and the dangers of cumulative poisoning. The extreme dilution of the solvent vapors which results from this practice renders recovery of the solvent so difficult and expensive that it is seldom attempted. Under special conditions, however, recovery is not only practicable but highly advantageous.

Where recovery is undertaken, it is very desirable to enclose the equipment in which the solvent is employed and evaporated. Under these conditions one can replace the air by inert, non-combustible gas, so that all danger of explosion disappears and the risk of fire is reduced to a minimum. Moreover, by operating the equipment under a very slight but definite vacuum, it is possible to have all gas leakage inward, so that exposure of the operatives to the toxic effects of the vapors is eliminated . Furthermore, in an enclosed space it becomes practicable greatly to reduce the volume of gas into which the solvent evaporates, thereby running up the concentration of solvent vapor and correspondingly increasing the ease and efficiency of recovery. This can be done under conditions that maintain even higher velocities and temperatures than those normally employed, thus increasing the rate and completeness of evaporation of the solvent and at the same time decreasing the heat consumption.

The only counterbalancing disadvantage lies in the fact that enclosing the equipment makes the work less accessible to the operatives, thereby interfering with inspection and adjustment of operating conditions. In the dipping of fabrics in the form of continuous rolls it has been proven practicable to make the process so nearly fool-proof that the necessity for intervention with the operation on the part of the workman becomes so infrequent that this disadvantage substantially disappears.

In many other operations of rubber manufacture it would seem possible to solve the problem by the development of more perfect mechanical designs, but to date this has not been accomplished practically. In many cases the amount of cement employed at a given point is so small and the necessity for direct manual manipulation so unavoidable that it seems hopeless to attempt to collect the vapor in a concentration sufficient to justify recovery.

Enclosed Drying Equipment

In the design of enclosed equipment for the evaporation of rubber solvents it is important to provide certain features that greatly influence operating efficiency. The size of the equipment should be kept down and particularly the cross section should be made small (best accomplished by the use of baffles) to secure the highest possible velocity of the drying gas over the stock, because this greatly increases drying rate. The drying gas should flow positively countercurrent to the movement of the stock from which the solvent is evaporating, since thereby it is possible to build up a high solvent-vapor concentration in the gas without sacrificing rate or completeness of drying. In this way ease of solvent recovery is secured.

The temperature of the drying operation should be as high as possible without danger of injury to the stock. Normally, with good rubber solvents, at temperatures of 140° F., complete drying can be realized at a high rate with no danger to the stock. There must be an adequate supply of heat in the drying equipment. This should be subject to control in the different stages of drying, since at the start, drying is usually rapid and the heat consumption correspondingly high, while toward the end the rate drops off.

Control of the Heat Supply

If the heat supply is not subject to proper control the temperature will rise excessively toward the end when the stock is no longer protected by the cooling action of the evaporating solvent, and also the temperature may be too low at the beginning when the heat consumption is great. The equipment must be solvent-tight and leakage, if it occurs, should be readily detectable and under no conditions liable to run into and to saturate the floor. Trouble in this regard is likely to develop at the bottom and at the joints between the bottom and the sides.

In the case of hydrocarbon solvents this difficulty can be avoided by maintaining a water seal on the bottom, the water level rising a short distance up the sides. Any solvent condensing in the equipment floats on the water and is withdrawn through a suitable overflow. It is important to maintain the water seal by flowing in continuously an excess of water which goes to waste, best through a separate visible overflow, externally located and connected with the water in the bottom of the equipment through a submerged U-type seal. The equipment should be thoroughly accessible.

A convenient method for accomplishing this is to have the top mechanically separate from the sides of the housing, resting in a water seal. The top can be removed by a hoist,

* This article reproduces, except for minor omissions, a paper read before the semi-annual meeting of the American Institute of Chemical Engineers at Cleveland, May 31 to June 3, the exact title being "The Use of Solvents in the Rubber Industry." The authors were R. P. Dinsmore and W. K. Lewis. The paper was accepted by the Institute as a joint contribution from the Goodyear Tire and Rubber Company, with which Mr. Dinsmore is connected, and the Research Laboratory of Applied Chemistry of the Massachusetts Institute of Technology.

and it is important that it be possible to lift it far enough so that it will not interfere with repairs. Where necessary a working platform may be provided around the top outside the housing itself. The points of entrance and exit of the stock should be so designed as to minimize gas leakage.

Roll fabrics can be introduced for dipping through a tall, narrow vertical slot down into the tank of cement, the cement itself serving as a seal. Since the solvent vapor is much heavier than air, the escape of vapor up this slot is exceedingly slow, because it can take place by diffusion only. Where the stock leaves the housing it is usually impracticable to use a liquid seal.

It is possible to provide at that point either a gas seal, involving a slight outflowing stream of vapor-free gas or another possible arrangement is to have the equipment under a slight vacuum so that air will leak in and thus eliminate escape of vapor to the outside room. In either case, it is imperative to have the pressure inside the equipment very close to atmospheric. It is best to maintain this by automatic control. It is important to have the initial travel of the stock, from the point of application of the solvent to the first point at which the rubber surface of the stock comes into contact with a foreign surface, sufficiently long and the drying conditions in this zone so intense that the stock is dried to a point where it is no longer tacky. Since, in general, head room is cheaper than floor space, it usually pays to get this long preliminary travel by a tall, vertical machine. Sometimes, it is possible to use a long, horizontal housing swung beneath the ceiling.

Minimizing Fire Hazard

Because of the risk of fire and explosion, the use of air in enclosed equipment of this type is indefensible. The use of inert gases was proposed over thirty years ago but flue gas, introduced during the war, offers by far the cheapest dependable source of supply. Any good fuel may be used but coke offers one of the simplest and safest arrangements. A deep fuel bed should be employed and no secondary air should be admitted. It is safest to have two furnaces, only one being used for gas generation at any one time, and this being sealed up during this operation. Meanwhile, the other is opened, ash is removed and fresh fuel is added. It is then sealed preparatory to cutting in when the fuel bed in the other becomes depleted. Coke gives a gas free from smoke and excessively fine dust particles. It can be cooled and cleaned by water spray and taken off through a water seal for use in the drying equipment. If the spray washing is not sufficiently thorough, the gas may be filtered prior to use.

Methods Of Recovery

The recovery of solvent vapors from gases is an extremely old art, having been practiced for nearly a century in the purification of coal gas. During recent years many methods of recovery have been tried on large scale, particularly in connection with the manufacture of so-called natural gasoline from natural gas. Because of this experience the methods available and their relative advantages and limitations are now understood.

In principle, the methods employed can be classified under four heads; cooling (with refrigeration where necessary), compression, absorption in liquid solvents and adsorption on liquid absorbents. Furthermore, these methods may be used in all sorts of combinations.

Operating experience can be generalized in the following rules, the exceptions to which are relatively few.

Where condensation of the solvent can be brought about by lowering of temperature with cooling water alone, without the use of refrigeration, this is the cheapest method available. Generally, however, the recovery is relatively incomplete and the cooled gas still carries considerable quantities of uncondensed vapor, both because of the high vapor pressure of the solvent and because of its high molecular weight. Where resort to refrigeration, applied in one form or another, is apparently necessary, it is usually cheaper to employ other methods.

Where the vapor concentration is very high, compression followed by water cooling is best; for lower but moderate vapor concentrations, the use of a liquid absorbent is superior. Because of the complications involved, these methods do not justify themselves unless the scale of operation is considerable.

Where vapor concentrations are very low, none of these methods can complete recovery, but in this case the use of high efficiency solid absorbents has proven successful. These are peculiarly effective in cleaning up the last traces of vapor from a gas.

Recovery by Cooling And Recycling

Experience has demonstrated that, in the rubber industry, where enclosed equipment can be designed and used which provides for the points outlined above it is possible to secure complete and rapid evaporation of the rubber solvents from the stock with the use of relatively little gas, thus developing vapor concentrations so high that water cooling will condense a large fraction of the solvent.

If the residual gas be reheated and recycled to the drying equipment, despite its vapor content it will very thoroughly dry the stock. It becomes theoretically possible to recover nearly all the solvent by water cooling alone. Where this system is applicable no other can compete with it, either in efficiency or in cost. It practically eliminates both the danger of industrial poisoning from the solvent and of explosions from the solvent vapors. In the design of equipment for this method of operation certain other than the precautionary measures already discussed should be kept in mind.

It is imperative to be in a position to reduce the solvent concentration in the rubber to any required degree. If recirculated gas be employed for the drying operation, it is obvious that the solvent in the rubber cannot be reduced below a point at which its partial pressure at the drying temperature is equal to that of the solvent vapor in the recycled gas. Unfortunately there are available no accurate measurements as to the vapor pressure equilibria of solvents absorbed by rubber. However, approximate data indicate that at equilibrium the weight per cent of solvent left in rubber can be estimated by the formula

$$x = 0.04\ M\ p/P_v$$

where M is the molecular weight for the solvent in question, p its partial pressure in the gas in equilibrium with the rubber, p_v the pressure of the pure solvent at the temperature of the operation and x the percent by weight of the solvent held in solution in the rubber. This formula must not be used except for traces of solvent, but plant experience indicates that it is safe as a basis for operating design.

This formula corresponds to equilibrium conditions, and it should be considered that the diffusion of the solvent from the rubber out into the gas takes place only under the driving impulse of a concentration gradient. The nearer equilibrium is approached the less this gradient and hence the slower the diffusion. However, at elevated temperature the rate of escape of volatile solvents from rubber is surprisingly high and the drying operation is far easier than might at first be assumed.

Removing Residual Solvent

If recirculated gas be used, the stock still contains some solvent at the point where it leaves contact with this gas. It is possible to remove this residual solvent and at the same time to overcome another difficulty. It has already been emphasized that it is impracticable to operate drying equipment of this sort under conditions that completely preclude gas leakage. It has also been indicated that it is advisable to maintain the housing under a very slight vacuum, so that any leakage that does occur is air inward rather than gas outward. Such a vacuum can only be maintained by removing continuously a small amount of gas from the housing. This tends to increase the oxygen content of the gas in

the equipment. Fortunately, however, the oxygen content can rise to quite high values before any possibility of explosion develops.

For many hydrocarbons it is impossible to get an explosive mixture if the gas contains less than approximately twelve per cent oxygen. There can be a large amount of air leakage inward before the danger point is approached. However, to maintain the oxygen content permanently below any specified value, it is necessary continuously to withdraw any discard gas from the equipment and to replace this by gas which is oxygen free or substantially so. The amount of this make-up flue gas depends on the amount of air leakage and this in turn is controlled by the design of the ports through which the stock enters and leaves the equipment and by the vacuum carried in it.

This vacuum should be the lowest that it is practicable to maintain continuously and with certainty. If this make-up gas is added at the end of the drying operation, flowing counter-current to the stock in the final stages of drying and not mixing with the recycled gas until later, it can be used for the final removal of solvent from the stock with but little sacrifice of recovery efficiency or of the drying capacity of the equipment.

Ventilating the Inert Gas

If an excess of this make-up gas be supplied at the point where the stock leaves the equipment, and if this excess serves as a gas seal to flow out with the stock and to prevent air leakage at that point, the amount of net make-up gas used for drying can be reduced to a very low figure. In this case it is necessary to provide active ventilation at the point where the stock leaves the housing to sweep away the inert gas that leaks out at that point, particularly because it may contain a small amount of carbon monoxide.

The discarded gas, equivalent in amount to the net make-up gas entering the housing, should be thrown away after cooling, because that is the point where its solvent content is least. If the volume of this gas is considerable, it may pay to recover the solvent from it by compression or otherwise.

It is desirable to have an automatic oxygen recorder on the equipment, designed either to give warning or preferably to shut down the apparatus in case the oxygen concentration becomes excessive. The writers prefer under no conditions to operate such apparatus when the oxygen concentration in it exceeds six per cent. There is no difficulty in keeping far below this limit.

Unfortunately a large percentage of the solvent used in the rubber industry is employed where the accessibility required for the operations precludes the complete enclosing of the equipment. It is sometimes possible to enclose the evaporative zone, even though the point of application of the cement or dough must remain open. The rate of evaporation of the solvent is highest at the point of highest concentration, which means at the point of application to the stock, so that under these conditions unrecoverable losses are considerable. It is the writers' conviction that such a system should never be operated except with inert gas in the enclosed part.

The units are usually small and experience has demonstrated that under these conditions the cost of recovery is almost independent of the size of the apparatus. Because of this, it seldom pays to recover if the solvent consumption is less than ten gallons per hour.

Principles of Condenser Design

In atmospheric coolers employed for condensation of the vapor from the gas, because of the high concentrations of condensible constituent, the coefficients of heat transmission realized are far larger than when cooling non-condensible gas. The data available are inexact and incomplete, but plant experience indicates that the coefficients can be estimated by the use of the formula, $h=0.01x^{2.2}$, x being the mol per cent of condensible vapor in the gas-vapor mixture at the point in question, and h the corresponding gas film coefficient, expressed as B.t.u. per degree Fahrenheit of temperature difference per sq. ft. of heating surface per hour. The formula has not been tested for plant results on vapor mixtures richer than 50 per cent and, since it is empirical, it should not be used above that point. Also the writers do not consider it safe for a mol fraction of vapor less than five per cent. The data on which it is based correspond to normal velocities up to but not exceeding 15 ft. per sec. Below five mol per cent of vapor it is recommended that the coefficients be used that are computed from the usual formulas for non-condensible gases.

Absorption on Solids

The use of solid absorbents for the selective removal of gases and vapors of high molecular weight from more permanent gases is very old but its potentialities were not realized before the war. When it became necessary to use activated charcoal in gas masks, engineers were impressed with the remarkable efficiency of this material, particularly for picking up exceedingly dilute vapors.

After the war the process was applied industrially and under suitable conditions, it has proven very successful. Silica gel has been recommended as an absorbent but industrial experience with it indicates that, except for special purposes, it is inferior to good activated carbon. Where in the course of rubber manufacture, solvent must be employed in open but relatively restricted spaces, it is possible to withdraw the air with a solvent concentration, which, while very low, is none the less recoverable by this means. It is peculiarly applicable to small installations.

How to Use Activated Carbon

It is possible to use a single container filled with activated carbon, through which the solvent-air mixture is drawn during the daytime period of operation, and from which the solvent is removed and recovered by distillation with superheated steam at night. The carbon is then cooled for re-use by drawing air through it. While the method suffers from the fire and explosion hazards inseparable from mixtures of combustible vapors and air however dilute[2], and while, because of the dilution, the per cent recovery is unusually low, despite the efficiency of activated carbon as an absorbent, the simplicity of the system strongly recommends it. The method has not been employed widely, partly, no doubt, due to patent litigation now under way concerning it. When this is settled this practice promises to become popular in the rubber industry.

Advantages Depend on Cost of Solvent

The economic advantage of solvent recovery depends on the cost of the solvent. In this country, where solvents are cheap, recovery is but little practiced. Abroad, where solvents are far more expensive, recovery methods are developed to a much higher degree. Even here recovery is essential in the artificial leather industry because its solvents are expensive, although in a rubber plant that is operating under parallel conditions, recovery may be inadvisable. However, one of the important factors justifying recovery is the matter of increased safety which it is possible to realize thereby and in many cases sufficient weight has not been given to this point.

The art of solvent recovery, with all its advantages, can be forwarded by closer cooperation of the operating engineer with the recovery expert in the design of equipment which will solve more adequately the mechanical problems of handling the stock without the necessity for constant attention and interference on the part of the workman.

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[2] To lessen the risk of explosion it is essential to dilute the solvent vapors with air to the greatest possible degree. To get satisfactory recovery, however, it is desirable to hold the concentration high. Both the designing engineer and the operating management in using this system are under the constant temptation to run up vapor concentrations, to attempt to increase the efficiency of solvent recovery at the expense of safety. This necessity for compromising safety as the only possible means to increase the material efficiency of the operation is a serious inherent disadvantage of this method of recovery.

and it is important that it be possible to lift it far enough so that it will not interfere with repairs. Where necessary a working platform may be provided around the top outside the housing itself. The points of entrance and exit of the stock should be so designed as to minimize gas leakage.

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It is possible to provide at that point either a gas seal, involving a slight outflowing stream of vapor-free gas or another possible arrangement is to have the equipment under a slight vacuum so that air will leak in and thus eliminate escape of vapor to the outside room. In either case, it is imperative to have the pressure inside the equipment very close to atmospheric. It is best to maintain this by automatic control. It is important to have the initial travel of the stock, from the point of application of the solvent to the first point at which the rubber surface of the stock comes into contact with a foreign surface, sufficiently long and the drying conditions in this zone so intense that the stock is dried to a point where it is no longer tacky. Since, in general, head room is cheaper than floor space, it usually pays to get this long preliminary travel by a tall, vertical machine. Sometimes, it is possible to use a long, horizontal housing swung beneath the ceiling.

Minimizing Fire Hazard

Because of the risk of fire and explosions, the use of air in enclosed equipment of this type is indefensible. The use of inert gases was proposed over thirty years ago but flue gas, introduced during the war, offers by far the cheapest dependable source of supply. Any good fuel may be used but coke offers one of the simplest and safest arrangements. A deep fuel bed should be employed and no secondary air should be admitted. It is safest to have two furnaces, only one being used for gas generation at any one time, and this being sealed up during this operation. Meanwhile, the other is opened, ash is removed and fresh fuel is added. It is then sealed preparatory to cutting in when the fuel bed in the other becomes depleted. Coke gives a gas free from smoke and excessively fine dust particles. It can be cooled and cleaned by water spray and taken off through a water seal for use in the drying equipment. If the spray washing is not sufficiently thorough, the gas may be filtered prior to use.

Methods Of Recovery

The recovery of solvent vapors from gases is an extremely old art, having been practiced for nearly a century in the purification of coal gas. During recent years many methods of recovery have been tried on large scale, particularly in connection with the manufacture of so-called natural gasoline from natural gas. Because of this experience the methods available and their relative advantages and limitations are now understood.

In principle, the methods employed can be classified under four heads; cooling (with refrigeration where necessary), compression, absorption in liquid solvents and adsorption on liquid absorbents. Furthermore, these methods may be used in all sorts of combinations.

Operating experience can be generalized in the following rules, the exceptions to which are relatively few.

Where condensation of the solvent can be brought about by lowering of temperature with cooling water alone, without the use of refrigeration, this is the cheapest method available. Generally, however, the recovery is relatively incomplete and the cooled gas still carries considerable quantities of uncondensed vapor, both because of the high vapor pressure of the solvent and because of its high molecular weight. Where resort to refrigeration, applied in one form or another, is apparently necessary, it is usually cheaper to employ other methods.

Where the vapor concentration is very high, compression followed by water cooling is best; for lower but moderate vapor concentrations, the use of a liquid absorbent is superior. Because of the complications involved, these methods do not justify themselves unless the scale of operation is considerable.

Where vapor concentrations are very low, none of these methods can complete recovery, but in this case the use of high efficiency solid absorbents has proven successful. These are peculiarly effective in cleaning up the last traces of vapor from a gas.

Recovery by Cooling And Recycling

Experience has demonstrated that, in the rubber industry, where enclosed equipment can be designed and used which provides for the points outlined above it is possible to secure complete and rapid evaporation of the rubber solvents from the stock with the use of relatively little gas, thus developing vapor concentrations so high that water cooling will condense a large fraction of the solvent.

If the residual gas be reheated and recycled to the drying equipment, despite its vapor content it will very thoroughly dry the stock. It becomes theoretically possible to recover nearly all the solvent by water cooling alone. Where this system is applicable no other can compete with it, either in efficiency or in cost. It practically eliminates both the danger of industrial poisoning from the solvent and of explosions from the solvent vapors. In the design of equipment for this method of operation certain other than the precautionary measures already discussed should be kept in mind.

It is imperative to be in a position to reduce the solvent concentration in the rubber to any required degree. If recirculated gas be employed for the drying operation, it is obvious that the solvent in the rubber cannot be reduced below a point at which its partial pressure at the drying temperature is equal to that of the solvent vapor in the recycled gas. Unfortunately there are available no accurate measurements as to the vapor pressure equilibria of solvents absorbed by rubber. However, approximate data indicate that at equilibrium the weight per cent of solvent left in rubber can be estimated by the formula

$$x = 0.04\ M\ p/P_o,$$

where M is the molecular weight for the solvent in question, p its partial pressure in the gas in equilibrium with the rubber, p_o the pressure of the pure solvent at the temperature of the operation and x the percent by weight of the solvent held in solution in the rubber. This formula must not be used except for traces of solvent, but plant experience indicates that it is safe as a basis for operating design.

This formula corresponds to equilibrium conditions, and it should be considered that the diffusion of the solvent from the rubber out into the gas takes place only under the driving impulse of a concentration gradient. The nearer equilibrium is approached the less this gradient and hence the slower the diffusion. However, at elevated temperature the rate of escape of volatile solvents from rubber is surprisingly high and the drying operation is far easier than might at first be assumed.

Removing Residual Solvent

If recirculated gas be used, the stock still contains some solvent at the point where it leaves contact with this gas. It is possible to remove this residual solvent and at the same time to overcome another difficulty. It has already been emphasized that it is impracticable to operate drying equipment of this sort under conditions that completely preclude gas leakage. It has also been indicated that it is advisable to maintain the housing under a very slight vacuum, so that any leakage that does occur is air inward rather than gas outward. Such a vacuum can only be maintained by removing continuously a small amount of gas from the housing.

This tends to increase the oxygen content of the gas in

the equipment. Fortunately, however, the oxygen content can rise to quite high values before any possibility of explosion develops.

For many hydrocarbons it is impossible to get an explosive mixture if the gas contains less than approximately twelve per cent oxygen. There can be a large amount of air leakage inward before the danger point is approached. However, to maintain the oxygen content permanently below any specified value, it is necessary continuously to withdraw any discard gas from the equipment and to replace this by gas which is oxygen free or substantially so. The amount of this make-up flue gas depends on the amount of air leakage and this in turn is controlled by the design of the ports through which the stock enters and leaves the equipment and by the vacuum carried in it.

This vacuum should be the lowest that it is practicable to maintain continuously and with certainty. If this make-up gas is added at the end of the drying operation, flowing counter-current to the stock in the final stages of drying and not mixing with the recycled gas until later, it can be used for the final removal of solvent from the stock with but little sacrifice of recovery efficiency or of the drying capacity of the equipment.

Ventilating the Inert Gas

If an excess of this make-up gas be supplied at the point where the stock leaves the equipment, and if this excess serves as a gas seal to flow out with the stock and to prevent air leakage at that point, the amount of net make-up gas used for drying can be reduced to a very low figure. In this case it is necessary to provide active ventilation at the point where the stock leaves the housing to sweep away the inert gas that leaks out at that point, particularly because it may contain a small amount of carbon monoxide.

The discarded gas, equivalent in amount to the net make-up gas entering the housing, should be thrown away after cooling, because that is the point where its solvent content is least. If the volume of this gas is considerable, it may pay to recover the solvent from it by compression or otherwise.

It is desirable to have an automatic oxygen recorder on the equipment, designed either to give warning or preferably to shut down the apparatus in case the oxygen concentration becomes excessive. The writers prefer under no conditions to operate such apparatus when the oxygen concentration in it exceeds six per cent. There is no difficulty in keeping far below this limit.

Unfortunately a large percentage of the solvent used in the rubber industry is employed where the accessibility required for the operations precludes the complete enclosing of the equipment. It is sometimes possible to enclose the evaporative zone, even though the point of application of the cement or dough must remain open. The rate of evaporation of the solvent is highest at the point of highest concentration, which means at the point of application to the stock, so that under these conditions unrecoverable losses are considerable. It is the writers' conviction that such a system should never be operated except with inert gas in the enclosed part.

The units are usually small and experience has demonstrated that under these conditions the cost of recovery is almost independent of the size of the apparatus. Because of this, it seldom pays to recover if the solvent consumption is less than ten gallons per hour.

Principles of Condenser Design

In atmospheric coolers employed for condensation of the vapor from the gas, because of the high concentrations of condensible constituent, the coefficients of heat transmission realized are far larger than when cooling non-condensible gas. The data available are inexact and incomplete, but plant experience indicates that the coefficients can be estimated by the use of the formula, $h=0.01x^{2.2}$, x being the mol per cent of condensible vapor in the gas-vapor mixture at the point in question, and h the corresponding gas film coefficient, expressed as B.t.u. per degree Fahrenheit of temperature difference per sq. ft. of heating surface per hour. The formula has not been tested for plant results on vapor mixtures richer than 50 per cent and, since it is empirical, it should not be used above that point. Also the writers do not consider it safe for a mol fraction of vapor less than five per cent. The data on which it is based correspond to normal velocities up to but not exceeding 15 ft. per sec. Below five mol per cent of vapor it is recommended that the coefficients be used that are computed from the usual formulas for non-condensible gases.

Absorption on Solids

The use of solid absorbents for the selective removal of gases and vapors of high molecular weight from more permanent gases is very old but its potentialities were not realized before the war. When it became necessary to use activated charcoal in gas masks, engineers were impressed with the remarkable efficiency of this material, particularly for picking up exceedingly dilute vapors.

After the war the process was applied industrially and under suitable conditions, it has proven very successful. Silica gel has been recommended in an absorbent but industrial experience with it indicates that, except for special purposes, it is inferior to good activated carbon. Where in the course of rubber manufacture, solvent must be employed in open but relatively restricted spaces, it is possible to withdraw the air with a solvent concentration, which, while very low, is none the less recoverable by this means. It is peculiarly applicable to small installations.

How to Use Activated Carbon

It is possible to use a single container filled with activated carbon, through which the solvent-air mixture is drawn during the daytime period of operation, and from which the solvent is removed and recovered by distillation with superheated steam at night. The carbon is then cooled for re-use by drawing air through it. While the method suffers from the fire and explosion hazards inseparable from mixtures of combustible vapors and air however dilute[2], and while, because of the dilution, the per cent recovery is unusually low, despite the efficiency of activated carbon as an absorbent, the simplicity of the system strongly recommends it. The method has not been employed widely, partly, no doubt, due to patent litigation now under way concerning it. When this is settled this practice promises to become popular in the rubber industry.

Advantages Depend on Cost of Solvent

The economic advantage of solvent recovery depends on the cost of the solvent. In this country, where solvents are cheap, recovery is but little practiced. Abroad, where solvents are far more expensive, recovery methods are developed to a much higher degree. Even here recovery is essential in the artificial leather industry because its solvents are expensive, although in a rubber plant that is operating under parallel conditions, recovery may be inadvisable. However, one of the important factors justifying recovery is the matter of increased safety which it is possible to realize thereby and in many cases sufficient weight has not been given to this point.

The art of solvent recovery, with all its advantages, can be forwarded by closer cooperation of the operating engineer with the recovery expert in the design of equipment which will solve more adequately the mechanical problems of handling the stock without the necessity for constant attention and interference on the part of the workman.

[2] To lessen the risk of explosion it is essential to dilute the solvent vapors with air to the greatest possible degree. To get satisfactory recovery, however, it is desirable to hold the concentration high. Both the designing engineer and the operating management in using this system are under the constant temptation to run up vapor concentrations, to attempt to increase the efficiency of solvent recovery at the expense of safety. This necessity for compromising safety as the only possible means to increase the material efficiency of the operation is a serious inherent disadvantage of this method of recovery.

Assessing Standard Production

The Effects of Rubber Restriction Have Been Partially Offset By Over-Liberal Estimates of What the Plantations Can Produce

By Everett G. Holt

Chief, Rubber Division, U. S. Department of Commerce

(The following is the first of two papers prepared by Mr. Holt to clarify certain aspects of British rubber restriction and its operations. The next paper will deal with the relation of standard production to unused export rights, and will appear in an early issue. These papers are being released through "Commerce Reports", the official organ of the Bureau of Foreign and Domestic Commerce.)

STANDARD PRODUCTION is the term used to describe the assessed production capacity of rubber estates and gardens in British Malaya and Ceylon. It is the figure to which are applied the percentages announced by the Colonial Secretary as exportable at minimum duty under restriction regulations, and as such it is the basis of the entire rubber-production restriction scheme.

For the first restriction year, standard production was supposed to be assessed on the basis of actual production during the year ended October 31, 1920; for subsequent years it was to be revised with allowance for new areas coming into bearing, greater yielding power of young producing trees just reaching full maturity, etc. The assessed standard production for an individual estate or for a region may or may not closely approximate the actual production capacity. Standard production is assessed by local administrative officials in British Malaya and Ceylon, who fix the figure for each rubber estate on the basis of records of yield submitted by the owner, subject to personal inspection and specified limits, the estate owner having right of appeal to official boards constituted to decide such appeals.

Assessed Too High at Beginning

A comparison of the standard production assessed for the first restriction year—November 1, 1922, to October 31, 1923—with the rubber exports of Malaya and Ceylon during 1920 is enlightening. The exports during the calendar year 1920 must have been reasonably close to the production during the fiscal year ended October 31, 1920, on which assessment of standard production was supposed to be originally based. The net exports of rubber from Malaya during the calendar year 1920 totaled 174,322 long tons; the assessed standard production for the first restriction year was originally announced as 270,000 long tons. For Ceylon the net exports during the calendar year 1920 totaled 39,532 long tons and the standard production for the first restriction year was 60,034 long tons. Thus the originally assessed standard production did not even closely approximate the actual production during the base year.

One effect of these original high standard production figures was to partially allay fears of consumers that an immediate severe curtailment of supplies would result through the application of restriction. Furthermore, this liberality reduced the objections of some producers to the adoption of governmental restriction. On the other hand, producers favoring restriction felt that its effect was likely to be nullified by the high standard production. Although the figure was much higher than had been generally anticipated for either Malaya or Ceylon, individual estates in each country appealed against their allowances, claiming that they had been underassessed and despite four years of restriction with annual or more frequent revisions of standard production these claims are still not uncommon.

Ceylon standard production has always been assessed much above the actual production capacity of the country. The following table shows actual exports of rubber from Ceylon from 1920 to 1926, calendar years, and the standard production assessed for corresponding fiscal years ended October 31. Owing to the application of restriction, the exports during 1923, 1924, and 1925 can not be considered to represent the producing capacity, but the 1926 figure is probably as closely representative as the exports during 1922, the last previous year of practically unrestricted exportation. The Ceylon standard production for the first restriction year was 52 per cent greater than the exports during the base year of 1920 and 28 per cent greater than the exports during the calendar year 1922.

CEYLON RUBBER EXPORTS AND STANDARD PRODUCTION

Year	*Domestic exports*[1] *Long tons*	*Assessed standard production*[2] *Long tons*
1920	39,532	——
1921	39,342	——
1922	46,694	——
1923	37,070	60,034
1924	37,945	62,282
1925	45,109	65,807
1926	58,962	70,475

[1] Calendar year [2] Restriction year ended Oct. 31.

For the restriction year, 1927, the standard production of Ceylon has been assessed at 73,839 long tons. The actual production capacity of Ceylon is believed to be approximately 61,000 long tons under conservative modern tapping methods at present in vogue. The assessed standard production is therefore about 22 per cent higher than the actual production capacity. In other words, when Ceylon rubber exports are restricted to 60 per cent of standard production, the country can export more than 72 per cent of its actual production. When allowed to export at the rate of 80 per cent standard production, producers in Ceylon are subject to less than 4 per cent restriction. Ceylon producers have accordingly actually restricted their production of rubber much less than the percentage called for under the restriction regulations from time to time.

The Ceylon standard production figure is announced shortly after the beginning of each restriction year and remains, substantially at least, unchanged throughout the course of the year. This early notice enables both producers and consumers to estimate closely the probable output of the country under varying degrees of restriction.

The standard production figure for Malaya, unlike that of Ceylon, has undergone frequent revisions as a result of special allowances to small holders, changes in the maximum production allowance per acre, appeals, and new areas coming into production. For the first restriction year, standard production for the mainland of Malaya was announced by the colonial office as 270,000 long tons; the allowance for Singapore and Penang was separately stated at 4,200 long tons. The Malayan figure included special concessions to native holders of the amount of 20,000 tons which did not become operative until the beginning of the second quarter. For the second restriction year, standard production was originally announced at 246,900 tons; this was increased by special allowances to small holders totaling 13,500 tons. For the third year, standard production was first estimated at 256,200 tons, exclusive of special allowances to small holders; the maximum production allowance per acre during the year was increased from 400 to 500 pounds, and the final standard

[Concluded on Page 300]

RECLAIMED RUBBER

[*A Series of Articles on Its History Development - Manufacture - Uses*]

BY
C. E. Bishop
Consulting Engineer
on Reclaimed Rubber

PART VI

Standardizing the Staple Lines of Reclaim

Establishing Standards for the Reclaimer's Leading Grades Is Entirely Feasible and Should Prove to be Good Business

ALL OF THE tire reclaims being offered to the trade by various reclaimers today are more or less different, particularly as to their physical qualities. Instead of being whole tire reclaims, some of these are really beadless tire reclaims and represent the result of processing according to a material formula consisting of, in some cases, an excess of tread-worn tires (more carcass) and in others a quantity of dykes (treads and sides free of carcass) while in others certain fillers are added, making an entirely different stock although it is still considered a whole tire reclaim.

This condition has come about in a most natural way for each reclaimer has developed his reclaim according to the desires of his own particular clients with the expectation that it would be accepted by the trade in general. In other cases, reclaimers were probably influenced by raw material conditions, not knowing the kind of tires or the quality of each of the different grades which must be used in uniform quantities if the finished product is to be similar in its physical qualities.

Reclaims of Identical Formulas May Be Unlike

Yet again, two so-called whole tire reclaims predicated upon the identical or practically identical material formula may be quite unlike due to following different process methods in their preparation. For instance, some grind material extremely fine, others only medium fine and still others find it advisable to grind only to a coarse condition, say minus one inch mesh.

In the devulcanization there is probably as great a diversified group of process methods as can be found in any industry. These vary not only as to the kinds of machines used and their layout, but are very dissimilar as to process formulas, i. e., quantity of material used, time, temperature, kind and strength of solutions, and plasticizing agents, where used. Some depend on automatic and others on hand control of temperature and steam pressure. These are known as the trade secrets and each reclaimer jealously guards them because many of them have been developed only at great expense and after much "cutting and fitting".

Furthermore each reclaimer has his own ideas as to the best machinery and layout for the succeeding operations of washing, drying, milling, refining and straining. All, or nearly all, samples of whole tire reclaims show evidence of being well refined. Some are better than others, of course, and these are easily detected by examining a freshly cut surface to see if it is very smooth and free of lumps. If such a product has been made of selected material, an analysis will show the maximum physical qualities.

There is a difference, however, in the fineness of the straining in different plants which has a great influence on the smooth appearance of the finished reclaim. If a fine wire cloth is used, say 60 mesh, the best results are obtained, although for wire insulation some material has been run special as fine as 100 mesh. Some reclaimers do not find it advisable to strain any finer than 30 mesh; in certain products such a reclaim will not be as satisfactory as could be desired while in other products it will serve very well.

In the past several years a number of modern machines for use in reclaiming plants have been introduced and adopted advantageously by some of the reclaimers. In fact, a fair degree of standardization has been attained in reclaiming equipment. It is most unfortunate that as great a degree of standardization cannot be attained in material formula and process methods. The last few years have been an era of standardization for many manufacturing industries, affecting material, machinery and methods. Most praiseworthy results have been obtained, better quality being secured at a lower ultimate operating cost.

In commenting on this subject of standardization, the author fully appreciates the fact that this principle can be applied only to certain reclaims which have become so generally used that they can be considered staple products. The reclaims thus referred to are as follows:

1. Beadless, black tire (two grades, first and second).
2. Beadless, red tire (one grade).
3. Beadless, white tire (one grade, nearly obsolete).
4. Solid tire (two grades, grey and black).
5. Carcass (two grades, black and brown).
6. Inner tube (two grades, pure gum and compounded).
7. Mechanical goods, misc. (two grades, first and second).

Sorting Standard Tires Into Two Classes

Contrary to the prevailing opinions expressed by some reclaimers, the sorting and segregation of standard tires and other materials into two classes as indicated above would not be difficult or expensive when it is once known to which class the various makes belong. Once outlined, such a basis of segregation could be adhered to, due to the manufacturers consistently following certain formulas which have been worked out and proven in their laboratories.

A still greater step toward the standardization of reclaims, the author ventures to believe, can be achieved by reclaimers marketing their product without working into them compounds of any kind. Ultimately this will be found to be the most satisfactory method.

Looking forward to the time when reclaimed rubber is produced entirely free of sulphur and of the highest quality permitted by the quality of the scrap materials used, then there should be not only an abnormal increase in the consumption of reclaims in products in which they are now used, but reclaimed rubber should also become a basic raw material for many new products and have a most desirable higher intrinsic value.

Standardizing quality almost always reduces cost and fairly

Other articles of this series have appeared in the five preceding issues of THE RUBBER AGE. These articles are copyrighted by the author and may be reprinted only by permission.

consistent selling prices follow as a natural law. This applies to any staple commodity and reclaimed rubber is no exception to the rule. Reclaims will continue to be made and used in large quantities but they will not attain a selling price consistent with the relative value of crude rubber so long as they are quoted at prices varying with stated qualities in each individual case and with no equitable and just basis of comparative value.

Surely low prices have not discouraged competition in rubber reclamation for three modern reclaiming plants have been engineered under the direction of the author within the last twenty months and are now operating at a profit in the face of prevailing low prices of reclaimed rubber. However, the services of the author's organization are also offered to existing reclaimers, among whom there will inevitably be considerable expansion.

In concluding the present series of articles, the author wishes to express his abounding faith in the future of the reclaimed rubber industry. Its importance to the success of the rubber manufacturers is acknowledged. Efficient reclamation prevents what would otherwise be a great national waste and assists more than any other factor in rubber conservation, the benefits of which are obvious.

[The above article concludes Mr. Bishop's present series on different aspects of the manufacture, distribution and use of reclaimed rubber. However, Mr. Bishop has agreed to contribute other articles along similar lines to THE RUBBER AGE, *the first of which will appear in an early issue.*—EDITOR.]

The South American Leaf Disease of Hevea

[*Continued from Page 294*]

plicates the problem somewhat but does not necessarily make it impossible of solution.

Work of this nature may be carried out as a matter of routine by a competent investigator attached to the staff of any up-to-date organization. When a more careful study of the botanical characters of the forms of *Hevea brasiliensis* in their natural habitats has been made it is believed that much of immediate practical value may be learned without the necessity of more elaborate methods.

The direct application of chemical substances in the control of leaf diseases is becoming an established practice on estates in South India and Ceylon. Special spray equipment for the application of Bordeaux mixture for the control of the Oidium and Phytophthora leaf-fall diseases is being devised and used with success. The effects of these diseases are very similar to that of the South American leaf disease and has threatened the industry in South India. The success of spraying as a preventive of Secondary Leaf-Fall in India has overshadowed other prophylactic methods, as, for example, the application of manure or soluble chemical substances for the purpose of making the chemical content of the host incompatible to the parasite and the destruction of sources of infection.

It has been shown in Guiana that the South American leaf disease may be controlled or held in check by spraying with Bordeaux mixture.

It is interesting to note that a recent article in THE RUBBER AGE[1] reports the apparent recovery of planted Hevea in Dutch Guiana from the effects of leaf disease. Detailed information on the present condition of the trees other than that they are being profitably tapped, is not given. The fact that the plantations were allowed to return to bush may have been a factor in retarding infections.

The foregoing statements have been confined chiefly to a discussion of the environmental factors as they affect the disease in the Amazon Valley. It is shown that if the prospective planter would successfully combat the fungus he will need to give attention to these factors. He must always be on watch for its appearance in the plantation as well as for other fungous diseases.

[1] See "Trees Recover from the Leaf Disease," THE RUBBER AGE, Vol. 20, Page 395, 1927.

Overassessing Standard Production

[*Continued from Page 298*]

production was stated as 276,793 tons. For the fourth year, standard production was at first erroneously announced as 298,810 tons, and later a corrected announcement was made, placing the total at 294,810; on the basis of export permits issued during the last quarter of the year, statisticians estimate the standard production at that time was over 320,000 tons. For 1927, the first announcement places Malayan standard production at 333,840 tons.

These statistics have been compiled from the Rubber Growers' Bulletin (British). The standard production stated for Malaya does not include allowance for the islands of Singapore and Penang for any year up to 1927; it is not definitely known whether the 1927 figure includes allowance for those islands. Announcement of Malayan standard production is usually much delayed; it has not been made promptly after the beginning of each restriction year. The pronounced increase in the assessed standard production during the past two years is especially noticeable.

The following export statistics represent net exports from British Malaya 1920 to 1923, and exports from restriction area of Malaya officially reported by the Rubber Controller for 1924 and subsequent calendar years. As in the case of Ceylon, exports during 1926 may be considered practically unrestricted the same as in 1922. The standard production of 270,000 tons originally announced for Malaya in the first restriction year was 55 per cent greater than Malayan net exports in 1920, the year on which assessments were to be based, and 22 per cent greater than the net exports for the calendar year 1922.

The standard production figures shown are those officially announced as final for Malaya, exclusive of Singapore and Penang islands.

MALAYAN RUBBER EXPORTS AND STANDARD PRODUCTION

Year	Domestic exports[1] Long tons	Standard production[2] Long tons
1920	174,322	——
1921	151,001	——
1922	212,434	——
1923	183,911	270,000
1924	165,241	260,400
1925	205,161	276,793
1926	283,607	294,810

[1] Calendar year. [2] Restriction year ended Oct. 31.

The actual exports from the restriction area of Malaya during the calendar year 1926 totaled 283,607 long tons. Production was practically unrestricted during the year, and producers might accordingly be considered to have produced at capacity. During the first half of 1926 many producers are understood to have held a part of their production on their estates so as not to further depress the falling market, but during the last half of the year exportation was stimulated by fear of cancellation of unused export permits. Some Malayan producers adopted alternate day tapping in 1926 and therefore did not produce at full capacity.

Assuming that the actual 1926 exports, 283,607 tons, were approximately equal to the production capacity, the present standard production (assumed not to include allowance for Singapore and Penang) of 333,840 tons is 17.7 per cent in excess of actual production capacity. In other words, when allowed to export at 60 per cent standard production, Malayan producers could export at 70 per cent of actual production capacity; at 80 per cent standard production they could export 94 per cent of production capacity.

Standard production is at present believed to be overassessed for both Malaya and Ceylon. At 60 per cent standard production, producers are allowed to export not only much more rubber but also a much greater percentage of their production capacity than when the regulations limited exportation to 60 per cent in 1924 or 1925. On the other hand, it would appear dangerous for reliance to be placed on the ability of either country to produce at a rate equal to 90 per cent (possibly even 85 per cent) of present assessed standard production, and in forecasts of future production this should be taken into consideration.

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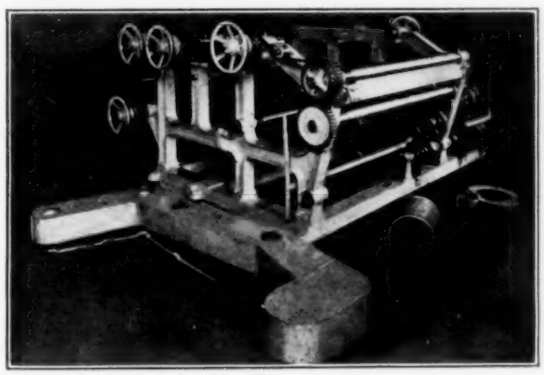

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The London Letter

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The Gentleman Foresees No Drastic Change in Restriction

LONDON, June 10, 1927

IN MY last letter I referred to a collection of factors of a favorable nature—from the rubber planters' point of view—which were beginning to manifest themselves on the rubber horizon, and which had occasioned a very obvious strengthening of rubber shares and a quite perceptible improvement of sentiment in Mincing Lane. The situation, in fact, was such that very little encouragement would have been necessary to embark the market upon a distinct upward movement. However, as is so often the case with this volatile commodity, the unexpected has happened, and during the past three days the spot quotation has fallen from 1/7¾ to 1/6d. per pound. After comparatively mild movements of the first five months of this year—the price having fluctuated during this period approximately between 1/7 and 1/8d. per pound with any day-to-day changes rarely exceeding one eighth of a penny per pound—this substantial decline has caused a flutter in the dovecots.

Dealers find it extremely difficult to put forward a logical explanation for the set-back. They argue that if there has been any justification for the unprecedently stable conditions obtaining since the beginning of the year in the face of an almost uninterrupted advance in London stocks, there can surely be no "rhyme or reason" for a fall just as the tide of available supplies is apparently about to turn.

So far as I can discover, the most popular theory on this side as to the genesis of the debacle is that the American Buying Pool is probably manipulating the market with the surplus rubber it has accumulated during recent months in order to create an atmosphere of uncertainty and nervousness. The latest tactics are ascribed, erroneously or otherwise, as merely part of a general campaign to discredit the Stevenson Restriction Scheme with the idea of forcing, if not its withdrawal, at least considerable modifications in its regulations next November.

THERE ARE certainly indications of activity in the anti-restriction camp in this country, and the *Evening Standard* (one of the prominent London daily newspapers) is devoting a good deal of space to criticisms of the Scheme. Some of the statements contained in these articles are of a distinctly misleading character, for a perusal of them would lead to the impression that there is a vast body of public opinion against the Scheme, whereas, in fact, it can definitely be stated that at least 95% of those connected with the rubber plantation industry are strongly in favour of its retention for some time to come. This sentiment holds both here in England and out in the producing countries.

It is true that a resolution has just been passed by the Planters' Association of Ceylon to the effect that "this Association is of the opinion that unless the pivotal price of rubber is reduced, reclaimed rubber will continue to be used to the detriment of plantation rubber", but the consensus of opinion throughout Ceylon is undoubtedly in favour of the continuation of restriction. In fact, a recent questionnaire in which the Government sought the views on this subject of the body just mentioned, together with the Chamber of Commerce, The Ceylon Estates Proprietary Association and the Ceylon Rubber Traders' Association, showed that each of these representative Associations were unanimous in supporting the continuation of the Scheme after the current year.

Apparently, there has been a fair amount of speculative selling of rubber from New York in the belief that the Restriction Scheme is in its last phases, but I must confess that there is little concrete support for this view, and I, for one, will be surprised should the British Government decide to interfere very drastically with the present regulations when the matter comes up for reconsideration next November.

INDEED, IT appears to me that in view of the weakness of the market there is quite a fair chance that any modification will take an opposite direction to that evidently expected on your side. In other words, some tightening up of the Enactment may be decided upon.

While on the subject, it may be relevant to refer to a speech just made by James Fairbairn, who is a well-known member of the Rubber Growers' Association and chairman of the Amalgamated Rubber Estates—one of the largest plantations in the Dutch East Indies. While referring to the substantial increase in the average price of the raw material in each of the four restriction years in comparison with the averages of 9¼d. and 10¼d. per pound ruling in the two years preceding the scheme, Mr. Fairbairn submitted the following proposals to the authorities:—

(a) A further revision of the assessment for standard production of estates which are unable by actual production figures to justify their present standard.

(b) Cancellation of the export credits and coupons thirty days after the expiration of each restriction quarter.

(c) Greater mobility to restrict and release on a monthly, rather than a quarterly, basis.

(d) Fixity of tenure of the scheme, for, say, five years.

I draw your particular attention to the above suggestions in order to indicate in which direction the wind is blowing among the leading producers.

Yours faithfully,

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LATE MARKET PRICES

Crude, Scrap & Reclaimed Rubber • Cottons and Fabrics

JUNE 17, 1927

COTTON

COTTON prices have continued erratic in the last fortnight, showing an inclination to fall and rise on weather reports. Prices fluctuated over a wide range, advances carrying new crop positions to new high levels for the season, being followed by a sharp break and a partial recovery. Notwithstanding the improvement in new crop prospects, there was no important bearish activity. Offerings on the decline passed into strong hands, the trade continuing to add to their holdings. The price of middling upland grade or October delivery declined on June 19 from 17.13 to 16.83, compared to 17.01 at the close of the previous day. Spot price was 16.75. Late prices follow:

	High	Low	June 17 Close	June 3 Close
July	16.85	16.58	16.65	16.59
October	17.21	16.93	17.01	16.95
December	17.43	17.16	17.24	17.20
Jan.	17.30	17.23	17.31	17.24

Tire Fabrics

There has been comparatively little activity in the market for tire fabrics, with conditions about normal. No prices have been cut, with rather an upward price trend on chafers and square woven fabrics. April consumption of fabric totaled 17,237,557 pounds, according to the Rubber Association. Recent prices follow:

CORD			
Peeler, carded, 25/5/3	lb.	.42 @	.43
Peeler, carded, 23/4/3	lb.	.42½ @	.44
Peeler, carded, 13/3/3	lb.	.38 @	.40
Peeler, carded, 15/3/3	lb.	.39 @	.41
Egyptian, carded, 23/5/3	lb.	.52 @	.55
Egyptian, combed, 23/5/3	lb.	.55 @	.57
CHAFERS			
Carded American, 8 oz.	lb.	.37 @	.40
Carded American, 10 oz.	lb.	.42 @	.44
Carded American, 12 oz.	lb.	.38 @	.42
Carded American, 14 oz.	lb.	.37 @	.40
LENO BREAKER			
Carded American, 8¼ oz.	lb.	.37 @	.39
Carded American, 10¼ oz.	lb.	.40 @	.41
SQUARE WOVEN			
Carded American, 17¼ oz. 13-11 ply	lb.	.41½ @	.42
Carded American, 17¼ oz. 10-5 ply	lb.	.37 @	.40

Sheetings

A number of calls for sheetings were for deliveries running into September, mills having nothing before October. Business in 40-inch sheetings have been of a routine character, with sales of 40-inch 2.85-yard at 10¼c and 40-inch 4.25-yard at 07½c. Recent market prices are as follows:

40-inch 2.50-yard	yd.	.11 @	.11¼
40-inch 2.85-yard	yd.	.10 @	.10¼
40-inch 3.15-yard	yd.	.10¾ @	.11
40-inch 3.50-yard	yd.	.09¾ @	.09½
40-inch 3.75-yard	yd.	.08¼ @	.08¾
40-inch 4.25-yard	yd.	.07¼ @	.07½

Ducks

Sales of cotton duck have held within smaller than usual limits. Mills have been in receipt of small orders, though not enough to regard the situation otherwise than quiet. Mills are busy manufacturing against contracts in hand, and are said to be accumulating comparatively few cloths for inventory purposes. On a few styles buyers are able to gain concessions. Prices follow:

Belting and Hose	lb.	.31 @	.33
Enameling	lb.	.31 @	.36
Shoe Ducks	lb.	.29½ @	.33½
Single filling	lb.	.13 @	.16
Double filling	lb.	.15½ @	.17

RECLAIMED RUBBER

Reclaimers report no change in production and shipment conditions. Rubber factories have decreased but slightly the volume of reclaimed rubber being used and up to the present time the drop in the crude rubber market has had no effect on reclaim prices. Quotations are unchanged as follows:

High Tensile			
Super-Reclaim No. 1 Black	lb.	.17½ @	.18
Super-Reclaim No. 2 Black	lb.	.14½ @	.15
High Tensile Red		.15 @	.15½
Shoe			
Unwashed	lb.	.08¼ @	.08⅝
Washed	lb.	.11 @	.11½
Tube			
No. 1 (Floating)	lb.	.18½ @	.19
No. 2 (Compounded)	lb.	.14 @	.14½
Tires			
Black, washed		.10½ @	.10¾
Black, unwashed		.08½ @	.08¾
Black selected tires	lb.	.09½ @	.10
Dark Gray	lb.	.12¾ @	.13¼
Light Gray	lb.	.13¼ @	.14
White	lb.	.15½ @	.16
Truck, Heavy Gravity	lb.	.08½ @	.09
" Light Gravity	lb.	.09 @	.09½
Miscellaneous			
Mechanical Blends	lb.	.08 @	.08½
Red	lb.	.15 @	.15½

SCRAP RUBBER

Scrap rubber prices have been easier in accordance with lower crude prices. Stocks have been slowly accumulating but there is still a scarcity of red tubes. Movement of scrap to reclaimers has eased off slightly. A number of grades are quoted lower, current prices being as follows:

[Prices to Consumer]

Auto tire peelings	ton	34.00 @	35.00
Standard White auto	ton	50.00 @	52.00
Mixed auto	ton	25.00 @	26.00
Bicycle tires	ton	24.00 @	25.00
Clean solid truck tires	ton	30.00 @	32.00
Boots and shoes	lb.	.01⅜ @	.01⅝
Arctics, trimmed	lb.	.01¼ @	.01⅜
Arctics, untrimmed	lb.	.00⅝ @	.01
Inner tubes, No. 1	lb.	.07⅝ @	.08
Inner tubes, No. 2, compounded	lb.	.05⅜ @	.06
Inner Tubes, Red	lb.	.06½ @	.06¾
Air Brake Hose	ton	35.00 @	36.00
Rubber Hose	ton	18.00 @	20.00

CRUDE RUBBER

WITHIN the last fortnight the outside market has reflected the sharp declines in rubber prices that took place on the Exchange in the same period. The declines, however, have not been as violent. Spot asking prices for ribbed smoked sheet have lost from 3 to 5 points, spot price being 35½c on June 17. On this day the standard grades were inclined to lower levels, after an early gain on cables from London and Singapore, but wound up ¼c higher on the spot and nearby deliveries. Factories as a rule were not interested in the market at the lower levels, and were withholding participation pending a further decline. Prices on June 17 were as follows:

Plantations—			
Ribbed Smoked Sheets			
Spot	.35½ @	.35¾	
June	.35½ @	.35¾	
July/September	.35⅝ @	.35⅞	
October/December	.35¾ @	.36⅛	
January/March	.36⅜ @	.36¾	
First Latex, crepe spot	.36 @	.36¼	
Amber Crepe, No. 2, spot	— @	.33½	
" " No. 3	.32¼ @	.32½	
" " No. 4	— @	.31¼	
Brown Crepe, Rolled	.30½ @	.30¾	
" " Clean, thin	.32½ @	.32⅝	
" " Specky	.31¾ @	.32¼	
Liquid Latex, per gal.	1.50 @	1.75	
Pontianac—			
Bangermassin	Nominal		
Palembang	Nominal		
Prime Pressed	Nominal		
Sarawak	Nominal		
Paras—			
Up-river Fine	.31 @	.31½	
" Medium	.29 @	—	
" Coarse	.20 @	.20½	
Acre Bolivian, fine	.31 @	.31½	
Tapajos, fine	.39 @	—	
Cut Beni Bolivian, fine	.45 @	—	
Caucho Ball—			
Upper, shipment	.21 @	.21½	
Centrals—			
Corinto, scrap	.27 @	—	
Esmeraldo, sausage	.21 @	.21½	
Guayule, washed and dry	— @	.31	
Africans—			
Benguela, No. 2	Nominal		
Congo, upper, black	Nominal		
" " red	Nominal		
Balata—			
Block, Columbia	.39½ @	.40½	
" Cuidad	.34½ @	—	
Gutta Percha—			
Siak	.24 @	—	
Red Macassar	3.00 @	—	

LONDON MARKET

Standard Ribbed Smoked Sheets—*Buyers*			
Spot	17⅛ @	17½d	
June	17¼ @	17⅜	
July/Sept.	17⅜ @	17½	
Oct./Dec.	17⅝ @	18	
Jan./March	18⅛ @	18½	

SINGAPORE MARKET

Standard Ribbed Smoked Sheets—*Sellers*			
Spot	17⅛ @	—	
May/June	17⅜ @	20	

Recent daily closing prices on the Rubber Exchange of New York are shown on the Financial Page in the News Section of this issue. Daily spot prices of Ribbed Smoked Sheets are given in the Statistical Section.

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Market for Rubber Chemicals Becomes Spotty

Let-up in Tire Production in Several Quarters Has Resulted in Decreased Shipments of Compounding Materials — Accelerators Lower.

NEW YORK, June 18, 1927—When some producers of chemicals and compounding materials report business fully up to April and May and others term the market unsettled and spotty, then the industry knows that the summer months are just around the corner. In recent years, however, the summer season has not brought any decided slump in the rubber industry but there has naturally been some easing-off in production.

Carbon black producers are continuing their high shipment schedules, especially to the Akron district where the larger plants are maintaining their tire production at almost peak levels. Other materials such as colors and accelerators, are not as active and July is not expected to bring any improvement.

In general quotations have been firm with a few notable exceptions. Hexa has decreased from 12½ to 15c., now being quoted at 65 to 70c. R & H 50 has likewise been twice decreased during this month and is now being sold at 50 to 55c.

ACCELERATORS

Organic

A-7	lb	.70 @	.80
A-11	lb.	.75 @	.90
A-16	lb.	.65 @	.85
A-19	lb.	.75 @	.90
Aldehyde ammonia, crystals	lb.	.80 @	.82
Aniline oil, drums	lb.	.17 @	.17½
"BB"	lb.	— @	—
Captax	lb.	— @	—
Crylene	lb.	.70 @	—
paste	lb.	.50 @	—
Di-Ortho-Tolylguanidine	lb.	.85 @	.90
Diphenylguanidine	lb.	.68 @	.72
Ethylidene aniline	lb.	.60 @	.65
Excellerex	lb.	.35 @	.40
Formaldehyde Aniline	lb.	.38 @	.42
Grasselerator 102	lb.	.80 @	.82½
Grasselerator 552	lb.	4.80 @	5.00
Grasselerator 808	lb.	1.15 @	1.35
Heptene	lb.	.55 @	—
Hexamethylene-tetramine	lb.	.65 @	.70
Lithex	lb.	.18 @	.20
Monex	lb.	3.25 @	—
Paraphenylenediamine	lb.	1.25 @	1.30
Piperidine-Piperidyldithio-Carbamate	lb.	4.80 @	5.00
Quinoidine	lb.	.40 @	—
R & H 40	lb.	.50 @	.55
R & H 50	lb.	.50 @	.55
Super-Sulphur No. 1	lb.	— @	—
Super-Sulphur No. 2	lb.	— @	—
Tensilac, No. 41	lb.	.65 @	.68
Thiocarbanilide, kegs	lb.	.26 @	.28½
Trimene	lb.	.75 @	—
base	lb.	1.20 @	1.35
Triphenylguanidine	lb.	.69 @	.73
Tuads	lb.	— @	—
Vulcone	lb.	.70 @	.74
Z. 88	lb.	.75 @	1.00
Z.B.X.	lb.	2.50 @	—
Zimate	lb.	— @	—

Inorganic

Lead, sublimed blue	lb.	.09 @	.09½
Lead, white	lb.	.09 @	.09½
Litharge, domestic	lb.	.11 @	.13
Magnesia, calcined, light	lb.	.06 @	.12
heavy	lb.	.04 @	.04½

COLORS

Blacks (See Compounding Materials)

Blues

Prussian	lb.	.33 @	.35
Ultramarine	lb.	.08 @	.35

Browns

Siena, Italian	lb.	.04½ @	.08
Umber, Turkey	lb.	.04½ @	.06

Greens

Chrome, light	lb.	.27 @	.31
medium	lb.	.29 @	.32
dark	lb.	.31 @	.34
Chromium Oxide, bbl.	lb.	.28 @	.32

Reds

Antimony crimson, 15/17	lb.	.27 @	—
sulphur free	lb.	.48 @	.50
golden 15/17 F.S.	lb.	.16 @	.22
Indian English	lb.	.08 @	.10
Oximony	lb.	.13¼ @	—
Para toner	lb.	.13 @	.14
Red oxide, reduced	lb.	.10 @	.11
pure	lb.	.14 @	.15
Toluidine toner	lb.	1.75 @	1.85
Venetian red	lb.	.02 @	.06
Vermillion, quicksilver, English	lb.	1.55 @	1.65

Whites

Lithopone, Akcolith	lb.	.05¾ @	.06
Lithopone, Azolith	lb.	.05¼ @	.05¾
Lithopone, Vanolith	lb.	.10½ @	—
Titanox	lb.	.12 @	.12½
Calc. Base Pigment	lb.	.10½ @	.11
Zinc Oxide—American Process			
American Azo: ZZZ (lead free)	lb.	.06½ @	.07
ZZ (under 5% leaded	lb.	.06⅝ @	.07⅛
Zinc Oxide—French Process			
White seal	lb.	.11⅞ @	—
Green seal	lb.	.10⅞ @	—
Red seal	lb.	.09⅞ @	—

Yellows

Chrome	lb.	.17 @	.20
Ocher, French medium	lb.	.03 @	.03¼
domestic	lb.	.01⅝ @	.02

COMPOUNDING MATERIALS

Aluminum Flake (f.o.b. plant)	ton	21.85 @	24.50
hydrate light	lb.	.16½ @	.17
Ammonia carbonate	lb.	.13½ @	.14
Are-O-Sol	ton	8.00 @	11.00
Asbestine	ton	14.75 @	18.00
Barium carbonate	ton	50.00 @	52.00
Barium Dust	lb.	.05 @	.06
Barytes southern off-color,	ton	12.00 @	18.00
Western prime white	ton	23.00 @	—
imported	ton	27.00 @	36.00
Basofor	lb.	.04½ @	—
Blacks			
Arrow "Aerfloted"	lb.	.08 @	.12
Bone Black	lb.	.05½ @	.11
Carbon, compressed	lb.	.07½ @	.11½
" uncompressed	lb.	.07 @	.11
Drop Black	lb.	.06 @	.10
Lamp "	lb.	.12 @	.40
Micronex	lb.	.08 @	.12
Thermatomic carbon	lb.	— @	—
Velvetex carbon	lb.	.04 @	.07
Blanc fixe dry f.o.b. works	lb.	.04 @	—
Carrara filler	lb.	.01¾ @	.02
Catalpo (fact.)	lb.	.02 @	—
Chalk	lb.	.02½ @	.04½
Clay, China, domestic	ton	8.00 @	9.00
Aerfloted Suprex	ton	9.00 @	20.00
Blue Ridge, Dark	ton	— @	—
" " Light	ton	— @	—
Dixie	ton	— @	—
Langford	ton	— @	—
Mineral Flour, c. l. fob mine	ton	20.00 @	23.00
Tensulite		15.00 @	—
Glues, extra white	lb.	.20 @	.29
medium white	lb.	.19 @	.25
common bone	lb.	.14 @	.15
Graphite flake, bbls.	lb.	.06½ @	.10
Magnesia, carbonate	lb.	.07 @	.09
Mica, powdered	ton	90.00 @	100.00
Rotten Stone (powdered)	lb.	.02½ @	.04½
Soapstone, powdered	ton	15.00 @	22.00
Starch, powdered	cwt.	3.30 @	3.70
Talc, domestic	ton	16.00 @	18.00
Terra Alba	cwt.	1.15 @	1.75
Tripoli, white	lb.	.01¾ @	.02
Whiting, commercial	cwt.	.85 @	1.00
English cliffstone	cwt.	1.50 @	—
Quaker	ton	— @	—
Superfine	ton	10.00 @	12.00
Sussex	ton	— @	—
Vansulite	ton	12.50 @	—
Wood pulp XXX	ton	45.00 @	—
" " X	ton	25.00 @	—
Zinc Carbonate	lb.	.10 @	.12

MINERAL RUBBER

Genasco (factory)	ton	50.00 @	52.00
Granulated M.R.	ton	— @	—
Hydrocarbon, Hard	ton	— @	—
Hydrocarbon, Soft	ton	— @	—
320/340 M.P. hydrocarbon (c. l. factory)	ton	47.00 @	52.00
300/310 M.P. hydrocarbon (c. l. factory)	ton	42.00 @	47.00
Paradura	ton	62.50 @	65.00
Pioneer, MR, solid	ton	41.00 @	43.00
" —granulated	ton	51.00 @	53.00
Robertson, MR, solid	ton	34.00 @	80.00
M.R. (gran)	ton	34.00 @	80.00

SOFTENERS

Acids

Nitric, 36 degrees	cwt.	5.00 @	5.25
Sulphuric, 60 degrees	ton	10.50 @	11.50
66 degrees	ton	15.00 @	16.00
Tartaric, crystals	lb.	.31½ @	—

Acids, Fatty

Stearex	lb.	.10 @	.14
Stearic, single pressed	lb.	.10 @	.11
double pressed	lb.	.11½ @	.12
triple pressed	lb.	.13½ @	.14

Alkalies

Caustic soda, 76%	cwt.	3.76 @	3.91
Soda ash, 58% C.L.	cwt.	1.42½ @	1.45

Oils

Castor, No. 3 bbls	lb.	.13¾ @	.14
Corn, crude, bbls.	lb.	.09¾ @	.10
refined	lb.	.11 @	—
Cottonseed, crude		.08 @	—
Cycline	gal.	.27 @	.34
Dispersol A (light)	lb.	.15 @	.16
" B (dark)	lb.	.14 @	.15
Fluxrite	lb.	.05 @	.06
Glycerine, C.P. drums	lb.	.26 @	.26½
Linseed, Raw C.L. bbl.	lb.	.09½ @	.10
Palm Lagos	lb.	.08½ @	—
Niger	lb.	.07½ @	—
Vansulol	lb.	.10½ @	—
Peanut, domestic, crude	lb.	.11 @	—
Petrolatum, white	lb.	.08¾ @	.09
amber	lb.	.03¾ @	.04
dark amber	lb.	.03⅜ @	.03½
Pine, steam distilled	lb.	.70 @	—
Rapeseed, refined	gal.	.82 @	.83
Rosin, first rectified	gal.	.70 @	—
second rectified	gal.	.73 @	—

Resins and Pitches

Pitch, Burgundy	lb.	.06½ @	.07½
coal tar	gal.	.05½ @	.06
pine	bbl.	9.00 @	10.00
Rosin, grade K	bbl.	11.40 @	—
Pigmentar	gal.	.33 @	.41
Tackol	lb.	.09 @	.15
Tar Retort	bbl.	15.50 @	16.00
kiln burned	bbl.	16.00 @	16.50

Solvents

Acetone, pure	lb.	.14½ @	—
Alcohol denatured, No. 1 bbls.	gal.	.37½ @	.44½
Benzol, 90%	gal.	.28 @	—
pure		.29 @	—
Carbon bisulphide	lb.	.05½ @	.06¼
Carbon tetrachloride		.06¾ @	.07½
Motor gasoline, steel bbls.	gal.	.20 @	—
Naptha, V. M. & P.	gal.	.14 @	—
Turpentine, spirits	gal.	.78 @	.79
wood	gal.	.72 @	.73

Waxes

Beeswax	lb.	.58 @	.60
Carnauba, No. 1	lb.	.57 @	.59
Ceresin, white	lb.	.13 @	.14
Montan, crude	lb.	.07 @	.07½
Ozokerite, black	lb.	.30 @	—
green	lb.	.30 @	.32

Miscellaneous

RSL Mold Solution	gal.	.75 @	1.00

ANTI-OXIDANTS

Age-Rite	lb.	— @	—
Antox	lb.	.81 @	.83
VGB	lb.	.55 @	.66

SUBSTITUTES

Black	lb.	.08 @	.14
White	lb.	.10 @	.16
Brown	lb.	.10 @	.15

VULCANIZING INGREDIENTS

Sulphur Chloride (drums)	lb.	.03½ @	.06
Sulphur flour			
Superfine, bags	cwt.	2.20 @	2.80
" bbls.	cwt.	2.55 @	3.10
100% pure, refined, bags	cwt.	2.60 @	3.15
bbls.	cwt.	2.95 @	3.50
Vandex	lb.	— @	—

A Section Devoted to Listings of Leading Producers and Distributors of Raw Materials, Machinery and Equipment, and Supplies for the Rubber Industry.

The Market Place

Chemicals and Compounding Materials — Machinery and Equipment—Crude, Reclaimed and Scrap Rubber—Fabrics—Rubber Products — Consulting Engineers.

Chemicals and Compounding Materials

ACCELERATORS—X L O and Diphenyl Guanidine.
Dovan Chemical Corp.
30 Church St. New York

CARBON BLACK—*Micronex* the world's standard gas black, universally known as the "King of Rubber Pigments."
Binney & Smith Co.
41 East 42nd St. New York City

CHEMICALS
CARBON BLACK—CROW BRAND
LAMPBLACK
QUINOIDINE
R. W. Greeff & Co.
64 Water St., New York

ACCELERATORS
Grasselerator 102
Grasselerator 552
Grasselerator 808
Grasselli Chemical Co.
Rubber Service Dept.
347 Madison Ave., New York

CARBON BLACK
Godfrey L. Cabot, Inc.
Manufacturers for forty years.
940 Old South Bldg., Boston, Mass.
612 Metropolitan Bldg., Akron, O.

CHEMICALS — Accelerators
Trimene Base, Heptene, Monex, Crylene, Lithex, Aniline Oil.
Clay—Mineral Flour, Seminole (Georgia).
Antioxidant—VGB, a proven product.
Labels—all-rubber two color brands.
Naugatuck Chemical Co.
1790 Broadway, New York.

ACCELERATORS
Triphenylguanidine
Para-Nitrosodimethylaniline
Thiocarbanilide
National Aniline & Chemical Company, Inc.
40 Rector St. New York City

ACCELERATORS— Every lot is tested before shipment and a written guarantee of quality furnished.
Roessler & Hasslacher Chem. Co.
709 Sixth Ave. N. Y. City

An Enlarged and Revised MARKET PLACE Section!

Not only has the rapidly increasing number of advertisers in this section necessitated the addition of an extra page each issue, but the new arrangement of placing each listing in its proper classification will make THE MARKET PLACE of greater usefulness to our readers and of still greater value to each advertiser.

ACCELERATORS
A-7 A-11 A-16 A-19 Z-88
THIOCARBANILIDE
FORMALDEHYDE—ANILINE
The RUBBER SERVICE LABORATORIES CO.
611 Peoples Savings & Trust Bldg.
Akron, Ohio

CARBON BLACK—*Aerfloted* Arrow Black for rubber compounding. Standard for grit-free uniformity.
J. M. Huber, Inc.
130 West 42nd St. New York

CHEMICALS and compounding ingredients; Clay, Whiting, Accelerators, Mineral Rubber.
R. T. Vanderbilt Co.
50 East 42nd St. New York City

ANTIMONY Pentasulphide, golden and crimson, very fine, pure.
Rare Metal Products Co.
Belleville, N. J.
Direct Factory Representation

CATALPO — The universal and standard rubber pigment now being used in treads, solids, tubes, carcass frictions, etc.
Moore & Munger
33 Rector Street
New York City

CHEMICALS—Complete line of rubber compounding materials, pigments and colors.
Complete problem laboratory for your use.
Send for latest quotations
Vansul, Inc.
90 West St., New York

ASBESTINE— Specially prepared for use in Rubber. Send for liberal working sample.
SOLE PRODUCERS
International Pulp Co.
41 Park Row, New York City

CHEMICALS—
RUBBER COLORS—ANTI-OXIDANTS
ACCELERATORS
Di-ortho-Tolylguanidine, Diphenylguanidine. Methylene-para-toluidine; Formaldehydeaniline. Vulcanol, Thionex, Vulcone, Vulcanex
E. I. du Pont de Nemours & Co., Inc.
Wilmington, Del.

CHEMICALS and Mineral Ingredients—Whiting, Clay, Talc, Barytes, Colors, Heavy Calcined Magnesia, Carbonate of Magnesia, Pumice Stone.
Standard Since 1890
Whittaker, Clark & Daniels, Inc.
245 Front St., New York

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The Market Place

Chemicals and Compounding Materials — Machinery and Equipment—Crude, Reclaimed and Scrap Rubber—Fabrics—Rubber Products — Consulting Engineers.

Chemical and Compounding Materials (continued)

CHEMICALS and COLORS
for all classes of mixing and cure. Complete rubber laboratory service for our customers.
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FACTICE—Prevents blooming, makes colors fast and a smoother batch.
Stamford Rubber Supply Co.
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RUBBER SUBSTITUTES
White, brown and black.
Carter Bell Mfg. Co.
150 Nassau St. New York

CLAYS for the rubber trade.
ARGOSITE CLAY—Pulverized—Special
CONGAREE CLAY—Pulverized—Standard
United Clay Mines Corp.
General Offices – – Trenton, N. J.

MICA — Water Ground and Water Floated — 160 Mesh —Absolutely Free from Grit. Akron Stocks, also Factory Shipments.
The C. P. Hall Co.
116 Central Savings & Trust Bldg., Akron

SOLVENTS
DIPPED GOODS NAPHTHAS
RUBBER SOLVENT GASOLINES
Tank Cars of 4, 6 or 8000 gal. capacity
Anderson-Prichard Oil Corp.
Oklahoma City Oklahoma

COLORS—for the rubber trade.
Gritless, dry colors especially processed for rubber compounding.
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Cincinnati, Ohio

MICA—160 mesh—water ground —water floated—free from foreign matter.
Stocks carried at Trenton, N. J.—Cleveland, O.—Chicago, Ill.
The Harshaw Fuller & Goodwin Company
Hanna Building, Cleveland, Ohio

STEARIC ACID
STEAREX, the product standardized for rubber compounding.
Binney & Smith Co.
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COLORS
BRILLIANT ORGANIC DYES; PERMANENT, NON-BLEEDING, LOW COST
For All Cures
The RUBBER SERVICE LABORATORIES CO.
611 Peoples Savings & Trust Bldg.
Akron, Ohio

PARA-FLUX
The Universal Softener—Adaptable, Uniform, Improves Quality—Economical.
The C. P. Hall Co.
116 Central Savings and Trust Bldg.
Akron, Ohio

SULPHUR—*"Tire"* Brand Superfine; *"Tube"* Brand Velvet; quality Sulphur for the rubber trade.
Stauffer Chemical Co., of Texas.
Scanlon Bldg. Houston, Texas
San Francisco, Cal. Chauncey, N. Y.

CUMAR—Paracumarone Resin
A neutral gum for rubber compounding.
Samples and prices on request.
The Barrett Company
40 Rector St., N. Y. City

PINE TAR — Retort "Sunny South", "Pentarco", "American". Brands for Tires, Tubes, Mechanicals,—Reclaim. *The Best Softener*
E. W. Colledge, Inc.
P. O. Box 356 Jacksonville, Fla.
Agents in New York, Chicago, Cleveland.

WHITING
Manufactured from white marble
BY
J. E. Baker Company
114 N. George St., York, Pa.

DIPHENYLGUANIDINE
Aero Brand, product of the highest purity from dependable source of supply.
American Cyanamid Co.
535 Fifth Ave. New York City

RED OXIDE—A special grinding, guaranteed uniform in color and quality.
Joseph A. McNulty
114 Liberty St. New York City

WHITING & PARIS WHITE
manufactured from *Genuine English Chalk* and *Cliffstone*—no adulterations.
Southwark Mfg. Co.
Camden New Jersey

DISPERSOL—A Softener
by a New Principle — A Distinct Aid to Compounding — Send for a Liberal Working Sample.
Dispersol Co., Inc.
117 Liberty St., New York

ROSIN OIL
LIGHT - MEDIUM - HEAVY
Great Lakes Rubber Products Co.
2570 Broadway, Cleveland, Ohio

ZINC OXIDES — Including KADOX and "Albalith."
The New Jersey Zinc Sales Company
New York Pittsburgh Chicago
Cleveland San Francisco

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Machinery and Equipment

BEAD CABLES— National Flat Woven and Pratt Patent Bead Cables.

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BOLTON BIAS CUTTER
Cuts cord or flat woven fabrics with equal ease and precision. In use all over the world.

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Textile-Finishing Machinery Co.
83 Exchange Place, Providence, R. I.

CONSULT BANNER
Before You Buy
TIRE BUILDING MACHINES
The Banner Machine Co.
Columbiana, Ohio
Paul A. Frank, Akron, Ohio, Agent.

CORES & DRUMS
India Collapsible Cores
Tire Molds
Collapsible Tire Building Drums
India Machine & Rubber Mold Co.
Akron, Ohio

DRY KILN—for drying crude rubber and chemicals—Hunter Process.

Carrier Engineering Corporation
750 Frelinghuysen Ave. Newark N. J.

ENGINEERS
Machinists, Iron and Steel Founders
Standard and Special
Rubber Working Machinery
The Adamson Machine Co.
Akron, Ohio

How Well Known **is** Your Product?

So well known that you no longer have to *sell* it? A listing in this section will keep your name and product before all the buyers in the industry—and will keep it *sold! Try it.*

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Cores, Chucks, Power Stands, Stock Racks, Tube MOLDS, Book Type MOLDS, Special Machinery.
DeMattia Brothers, Inc.
Clifton, New Jersey

MACHINERY—
Heater Presses, Molds and Cores, Tubing Machines.
The Williams Foundry & Mach. Co.
"In Business Since 1888"
Akron, Ohio

MANDRELS--CIRCULAR
and Economy Calender Shells
Prompt Service—Let us quote you.
The Clyde E. Lowe Co.
2976 E. 81st St., Cleveland, Ohio

LABORATORY Apparatus
Bierer-Davis Aging Apparatus; Emerson Water Bath; Rubber Buffing Machine; Emerson Fuel Calorimeter; Emerson Textile Conditioning Ovens.
Emerson Apparatus Co.
Melrose, Mass.

LUBRICATORS—
Lubricators — Oil Filters — Oiling Systems — Oil Storage — Accessories
Send to Dept. 76 for catalogs.
S. F. Bowser & Co., Inc.
Fort Wayne, Indiana.

MOLDS AND CORES—
Tire building equipment; general machine work.
The Akron Equipment Co.
Akron, Ohio

MOLDS
FOR TIRES, MECHANICAL GOODS & DRUGGIST SUNDRIES.
The Akron Rubber Mold & Machine Co.
AKRON, OHIO.

MOLDS & CORES—Tire building machines; tire finishing stands; tubing machines; hydraulic presses.
The Akron Standard Mold Co.
Akron, Ohio

MOLDS & CORES
SPECIAL MACHINERY
SWING JOINTS
Specify Bridgwater Service
The Bridgwater Machine Co.
AKRON OHIO

MOLDS & CORES—for automobile tires; general machine work.
Kuhlke Machine Co.
Akron, Ohio

MOLDS AND CORES —
Also Non-Skid Engraving Machines. Licensees for Watch-case Heaters and India Cores & Chucks.
The Franz Foundry & Machine Co.
Akron, Ohio

MANY BIG advertisers started with little space. Spaces in this section are small in size but big in returns. Try one!

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A Section Devoted to Listings of Leading Producers and Distributors of Raw Materials, Machinery and Equipment, and Supplies for the Rubber Industry.

The Market Place

Chemicals and Compounding Materials — Machinery and Equipment—Crude, Reclaimed and Scrap Rubber—Fabrics—Rubber Products — Consulting Engineers.

Machinery and Equipment [continued]

STRIP CUTTING MACHINES
For cutting all rubber, composition and plain or impregnated fabrics.
Cameron Machine Co.
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USED MACHINERY
We always have on hand Rubber Machinery — Power House and Electrical Equipment Priced for Quick Sale.
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6306 Kinsman Ave., Cleveland, Ohio

USED MACHINERY
Calenders — Mills — Tubers at attractive Prices always on Hand. Wire or Write your Requirements.
Surplus Trading Corp.
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TESTING MACHINES
RUBBER TENSILE TEST MACHINES
TEXTILE TESTING MACHINES
Write for Descriptive Literature
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USED MACHINERY
We buy, Sell or Exchange all Kinds of Rubber Machinery—Specializing in Purchase of Complete Plants.
Equipment Company, Inc.
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USED MACHINERY
We are now in our new location and are ready to fill your needs for used equipment.
United Rubber Machinery Exchange
319 Frelinghuysen Ave., Newark, N. J.

TUBING, INSULATING and Straining Machinery
"Perfected" equipment for inner tubes, treads, and tire beads. Circular hose looms.
John Royle & Sons
Paterson New Jersey

USED MACHINERY
Mills, Calenders, Grinders, Washers
New and Old Rubber Scrap
Rubber Cloth Remnants
M. Norton & Co.
Locust St. Medford, Mass.

Your Products Listed Here
reach buyers in rubber factories at a cost lower than is possible by any other method.
ARRANGE FOR YOUR LISTING TODAY!

USED MACHINERY
We have on hand, ready for prompt shipment, guaranteed machinery for every branch of the rubber trade.
L. Albert & Son, Inc.
Trenton, N. J. Akron, O.

USED MACHINERY
A complete Stock of New and Used Rubber Machinery on Hand for Immediate Shipment.
Send for Latest List.
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1105 Chester Ave., Cleveland, O.

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HEELS, soles and strips
We can make any special brand with your molds or with ours. Best quality at the lowest price. Consult us.
P. & B. Rubber Mfg. Co., Inc.
Laurel Hills, Long Island, N. Y.

SANITARY GOODS —
Dress Shields, Reducing Garments, Sheetings, Aprons, Bathing Caps, etc.
I. B. Kleinert Rubber Co.
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TIRES—For Every Transportation need from the Ford Runabout to the heaviest truck and Multiple passenger coach.
Fisk Rubber Co.
250 West 57th St., N. Y. City

RUBBER PRODUCTS
Sanitary Goods, Sheetings, Bathing Caps, Aprons, Rubber Specialties.
Sheet Gum Cut to Pattern
RANDPRINT RUBBER
Rand Rubber Co., Inc.
Sumner Ave. & Halsey St., Brooklyn, N. Y.

SANITARY GOODS—
Dress Shields, Baby Pants, Aprons, Elastic Belts, Bloomers, Stepins, Bibs, Guimps and Brassieres.
SPECIAL GOODS CUT TO ORDER
Rand Rubber Co., Inc.
Sumner Ave. & Halsey St., Brooklyn, N. Y.

TIRES
"Goes a long way to make friends"
General Tire & Rubber Co.
Akron, Ohio

RUBBER PRODUCTS
Manufacturers of all classes of Rubber Goods.
United States Rubber Co.
1790 Broadway, New York City

Do you BELIEVE in your products?
Then you should believe in telling the rubber industry all about them. The MARKET PLACE is the logical place to display your wares.

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The Market Place

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Rubber— Crude, Scrap, Reclaimed

CRUDE RUBBER
We Solicit Your Inquiries
H. Muehlstein & Co., Inc.
41 East 42nd. St., N. Y. City
Offices in Akron, Chicago, Boston.

RECLAIMED RUBBER—
Uniformity, reliability, cleanliness.
Pequanoc Rubber Co.
Butler, N. J.

RECLAIMED RUBBER
A standardized grade for every requirement.
U. S. Rubber Reclaiming Co., Inc.
100 E. 42nd St., New York, N. Y.
"44 Years Serving the Industry Solely as Reclaimers"

CRUDE RUBBER
Importers
Members Rubber Exchange of N. Y., Inc. and Rubber Exchange Clearing House, Inc.
Charles T. Wilson Co., Inc.
82 Beaver St., New York
AKRON OFFICE: 507 Second Nat'l. B'ldg.

RECLAIMED RUBBER
of Standardized Quality.
NO. 188 FOR TUBES
Philadelphia Rubber Works Co.
New York Akron Philadelphia

RECLAIMED RUBBER
The Xylos Rubber Co.
Akron, Ohio
CAPACITY 250,000 POUNDS DAILY

GUAYULE—"Duro" Brand washed and dried ready for compounding.
Continental Rubber Co.
1775 Broadway New York

RECLAIMED RUBBER—
for all purposes.
Rubber Regenerating Co.
Naugatuck, Conn.

RUBBER—Crude and scrap, all grades.
H. Muehlstein & Co.
Liggett Bldg. New York
Akron, Chicago, Boston, Hoboken

HARD RUBBER DUST
All Degrees of Fineness to Meet Every Manufacturing Need.
Great Lakes Rubber Products Co.
2570 Broadway, Cleveland, Ohio

RECLAIMED RUBBER
Well Known Standards
Monatiquot Brands
Stedman Products Company
South Braintree, Mass.

RUBBER SCRAP
Always Buying and Selling
Rubber Waste, Cured and Uncured, Hard Rubber, Balata, Gutta Percha.
HERMAN WEBER
Newark & Jackson Sts., Hoboken, N. J.

Miscellaneous— Fabrics, Consultants, etc.

CHEMIST, Consulting — Testing, formulae, costs, experimental work on all classes of rubber products. Litigation.
Fred'k. J. Maywald, F.C.S.
5 William St., Belleville, N. J.

CONSULTING
Rubber Technologist
R. R. Olin Laboratories
P.O. BOX 72, AKRON, OHIO
Telephones: Barberton 828, Portage 403-R

FABRICS—Tire fabrics—coarse builders, chafers, breakers in all grades.
New England Southern Mills
LAWRENCE & CO.
24 Thomas St. New York
Boston, Philadelphia, Chicago, St. Louis, San Francisco

CONSULTING ENGINEER
Specializing on Rubber Reclaiming Organizing — Controlling — Research. Buildings — Machinery — Formulas.
C. E. Bishop
809 United Bldg., Akron, O.

FABRICS—Tire, cords, enameling ducks, drills, sheetings, osnaburgs.
J. H. Lane & Co.
250 West 57th St. New York City

LINERS — PROCESSED
For
Various Rubber Stocks
The Cleveland Liner & Mfg. Co.
5508 Maurice Ave., Cleveland, O.

The Most Economical Form of Advertising

The Market Place Section of THE RUBBER AGE contains the *only* alphabetically arranged listings of small 'ads' available in the rubber industry. Your advertisement in this section will not only be easy to find, but it will produce excellent results at very moderate costs. Let us send you details.

TRADE MARK

United States Rubber Company

MAIN OFFICE:

1790 Broadway, New York

Fifty-Three Factories
Branches in all Principal Cities

Manufacturers of All Classes of Rubber Goods, including—

"U. S." ROYAL CORD AND USCO BALLOON TIRES
"U. S." ROYAL CORD AND USCO CORD TIRES
"U. S." ROYAL CORD MOTORCYCLE BALLOON TIRES
"U. S." ROYAL CORD MOTORCOACH TIRES
"U. S." ROYAL CORD HEAVY SERVICE TIRES
"U. S." TWIN CUSHION, CUSHION, HIGH SIZE CUSHION and DEMOUNTABLE CUSHION TRUCK TIRES
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"U. S." PARACORE INSULATED WIRE AND CABLE
"U. S." BATHING APPAREL

United States Rubber Export Co., Ltd.

Exporters of the Products of

United States Rubber Company

AND

Dominion Rubber Company, Limited

MAIN OFFICE:

1790 Broadway, New York, U. S. A.

Branches and Distributing Agencies in all leading cities of the World

STATISTICAL SECTION

TIRES & TUBES
CRUDE RUBBER

AUTOMOBILES
GASOLINE

RUBBER invoiced to the United States, according to statistics from the Department of Commerce, in the week ending June 4 was the largest amount received in the country since the week of March 26. The total amount of rubber invoiced in that week was 9,318 long tons.

The official estimate of crude rubber imports during May, based on arrivals in New York and Boston, totaled 34,413 long tons. Consumption during the same period, according to figures released by the Rubber Association, totaled 34,592 long tons, showing a slight excess of consumption over imports.

April statistics relative to the production of automobile casings and inner tubes show a continued increase in output, but not in such large quantities as was the case in March.

Stocks of crude rubber on hand at the end of May were the largest in the past three years, namely 94,563 long tons. Rubber stocks afloat to the United States at the end of May, however, were the smallest in the last three years, with a tonnage of 33,157. London stocks of crude rubber in the last week of May totaled 67,054, but with the first week in June this was increased 51 tons, making stock on hand in London 67,105 tons. In the second week of June, London stocks were still further increased by 349 tons, making a total tonnage of crude rubber in London on June 11 of 67,454.

Rubber stocks in Singapore and Penang on May 31 totaled 25,133 long tons, or an increase of 590 long tons.

PLAN OF THE SECTION

The statistics included in this section have been chosen for their constant importance to the rubber industry. The tables are reprinted in the same relative position in every issue, each table being kept current by the addition of new figures as soon as they become available. The section accordingly affords the most up-to-date, complete and convenient statistical service in the industry.

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Stocks of Crude Rubber in London
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Rubber Imports into Consuming Countries

U. S. Imports and Exports of Crude Rubber.

	Gross Imports			Re-exports			Net Imports
YEARS	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons
1921	185,394	73,772,677	17.76	5,716	2,414,924	18.86	179,678
1922	301,076	101,843,188	15.10	4,809	1,921,828	17.84	296,267
1923	309,144	185,060,304	26.72	8,772	5,672,319	28.87	300,372
1924	328,056	174,231,331	23.71	10,309	6,057,637	26.23	317,747
1925	396,642	429,705,014	48.36	14,827	19,847,753	59.76	381,815
1925:							
Jan.	32,898	22,406,756	30.41	1,162	963,593	37.02	31,736
Feb.	24,696	18,532,115	33.50	979	779,406	35.53	23,717
Mar.	33,072	25,146,691	35.94	1,345	1,105,119	36.69	31,727
Apr.	32,506	24,874,562	34.16	1,130	1,009,305	39.86	31,376
May	36,932	30,311,754	36.64	1,203	1,323,445	49.12	35,729
June	31,569	26,855,883	37.98	1,198	1,577,106	58.75	30,371
July	32,455	33,701,723	46.36	1,278	2,132,681	74.52	31,177
Aug.	33,412	39,834,348	53.22	1,131	1,623,258	64.08	32,281
Sept.	26,367	36,686,013	62.11	1,154	1,820,360	70.41	25,213
Oct.	34,651	50,027,338	64.45	1,132	1,989,291	78.43	33,519
Nov.	37,755	56,271,963	66.54	1,605	2,898,930	80.65	36,150
Dec.	40,329	65,055,868	72.02	1,510	2,625,259	77.61	38,819
	396,642	429,705,014	48.36	14,827	19,847,753	59.76	381,815
1926:							
Jan.	42,404	72,528,151	76.36	2,084	3,747,505	80.28	40,320
Feb.	32,865	58,733,370	79.78	1,430	2,280,168	71.17	31,435
Mar.	42,152	70,589,581	74.76	1,836	2,735,234	66.51	40,316
Apr.	34,544	48,742,539	62.99	1,128	1,605,093	63.58	33,416
May	29,756	36,896,080	55.35	1,052	1,558,987	66.17	28,704
June	24,900	34,498,561	61.85	1,105	1,371,217	55.41	23,795
July	35,820	33,061,470	41.20	1,554	1,743,854	50.09	34,266
Aug.	27,400	24,670,752	40.21	1,318	1,339,563	45.38	26,082
Sept.	37,112	32,625,032	39.02	1,437	1,519,870	47.20	35,675
Oct.	29,333	25,300,483	38.50	1,366	1,316,270	43.02	27,967
Nov.	38,925	34,661,631	39.97	1,482	1,320,461	42.00	37,443
Dec.	37,754	33,261,366	39.33	1,904	1,841,305	43.16	35,850
	413,338	505,817,807	54.63	17,671	22,470,583	56.77	395,667
1927:							
Jan.	43,340	36,753,719	37.99	1,526	1,444,734	42.22	41,814
Feb.	28,338	23,110,257	36.41	2,451	2,277,297	41.47	25,887
Mar.	35,514	28,693,026	36.07	2,763	3,249,665	52.50	32,751
Apr.	46,202	37,284,806	36.15	1,575	1,428,425	40.45	44,627
May*	34,413	——	37.63				

*Official estimate based on arrivals in New York and Boston.

U. S. Consumption of Crude Rubber

(Rubber Association of America statistics raised to 100 per cent—All figures in long tons)

	Figures on Monthly Basis						
	1921	1922	1923	1924	1925	1926	1927
January	5,045	16,938	30,106	29,058	29,638	32,196	31,518
February	5,955	14,767	30,149	25,786	29,761	31,136	30,187
March	9,190	21,408	36,629	28,385	33,498	32,936	36,141
April	13,084	19,294	29,085	27,129	34,139	32,696	35,871
May	16,023	23,246	36,155	25,845	35,322	29,364	34,592
June	16,142	31,713	24,272	22,753	35,822	28,598	
July	18,310	24,522	17,685	23,396	36,053	27,577	
August	23,649	29,361	20,359	28,982	35,909	34,533	
September	16,705	24,410	17,594	31,497	31,691	32,904	
October	16,814	26,881	21,321	31,520	29,047	29,836	
November	14,105	24,950	20,437	27,289	28,853	28,080	
December	15,482	25,070	21,902	27,199	28,748	26,293	
TOTALS	170,504	282,560	305,694	328,769	383,481	366,149	

	Figures on Quarterly Basis					
Quarter	1921	1922	1923	1924	1925	1926
Jan./Mar.	65,463	127,360	96,776	87,609	95,263	94,301
Apr./Jun.			89,493	75,674	104,099	87,109
Jul./Sept.	105,962	155,067	55,621	83,813	99,493	93,793
Oct./Dec.			63,617	92,656	85,789	83,212
Total	171,425	282,427	305,507	339,752	384,644	358,415

Note: The Rubber Association estimates its monthly rubber consumption figures to be 90% complete. Up until 1925 the quarterly figures were likewise estimated to be 90% complete; beginning with 1925 an estimate of 92% completeness has been used. These estimates have been used in raising the figures in this table to 100%. The quarterly figures are generally regarded as the most authentic; the monthly figures may be accepted as preliminary.

Rubber Invoiced to the U. S.

(Reported by American Consuls—Quantities in Long Tons)

During the Week Ended	From Br. Malaya	From Ceylon	From Dutch East Indies	From London & Liverpool	Total
Apr. 9	5,536	584	805	1,295	8,220
Apr. 16	3,875	1,037	1,513	624	7,049
Apr. 23	5,548	1,099	1,241	475	7,463
Apr. 30	5,250	1,033	1,336	324	7,943
May 7	5,764	431	1,778	464	8,437
May 14	4,749	570	1,054	1,327	7,700
May 21	4,853	505	2,125	897	8,380
May 28	4,687	546	1,540	777	7,550
June 4	6,088	344	2,432	454	9,318
June 11	3,492	486	781	287	5,046

Daily Spot Closing Prices of Ribbed Smoked Sheet Rubber—New York Market, in Cents per Pound

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Average
1925																																
Jan.	—	39⅞	39⅝	—	39	39	39¾	38⅝	38⅝	38⅝	—	38⅞	36⅞	36⅜	36	35⅞	35⅝	35¾	34⅜	34⅜	35	35½	36¼	36¼	—	35⅝	35⅝	35⅝	35	35	35⅝	36⅛
Feb.	—	35⅝	34⅝	34½	34½	34½	35⅜	—	35⅛	35¼	35¼	39⅝	35⅝	35⅛	35	35⅝	36⅝	36¼	36¼	36⅜	36⅜	—	37⅛	37¼	37⅛	37⅛	38⅛	38⅛	—	—	—	36
Mar.	—	38⅝	38⅝	38⅝	38⅝	39¾	39¾	—	—	39⅝	40¼	40⅛	40⅛	40⅛	—	40⅜	40½	41	41½	41⅞	41⅞	—	42⅛	42⅜	43⅛	43⅛	43⅛	43⅛	43½	44¼	42¾	41
Apr.	41¼	41⅝	41¼	41⅝	41⅝	42⅜	42⅜	43½	43⅝	42⅜	—	—	44⅛	44⅛	44⅛	44⅜	44⅛	44½	44	44	44⅛	43⅜	43⅜	43⅜	44⅜	44⅜	45⅜	45⅜	45⅜	44¾	—	44⅛
May	45	45⅛	—	47½	46⅞	48⅜	50⅛	52½	55⅜	—	—	59	57	59¼	60	60⅜	64¼	63	61¾	61⅜	60⅝	61⅜	63	63½	65	63½	65⅞	65⅞	69½	69½	65⅝	65⅞
June	69½	72	74⅞	76⅞	75¾	75⅝	88⅛	86⅜	73⅜	74	95⅞	106⅜	74⅜	76⅜	74⅜	71⅛	71⅝	72⅝	73¾	75½	76¼	79⅛	79¼	85⅞	85⅞	87	89⅞	96⅜	93⅜	82⅜	89⅜	89⅞
July	81⅛	81⅞	85⅞	—	85⅜	86⅜	90½	81¾	94⅞	95⅛	71⅞	72½	76⅛	110	105⅜	110⅝	117	—	93⅜	77¾	71⅝	72⅝	117¾	119	117⅜	112¾	107⅜	96⅜	85⅜	87¾	91½	93⅜
Aug.	94½	—	95½	88⅜	81⅜	86⅜	81⅜	79	—	78⅛	83	86½	92	76⅛	105⅜	110⅝	116¾	118⅞	80⅜	80½	92⅜	99	107	109⅜	110⅛	110½	112¼	82½	85¼	85¼	89½	91½	100⅜
Sept.	88½	87⅛	85	91⅜	92	—	97	99	80½	83	100⅛	101½	97⅜	92½	93⅜	95½	99	92⅜	94¼	—	92	99	101¼	102	88¼	82	89	89	89	89½	99¼	100¾
Oct.	91½	91⅜	—	94½	94½	97	100¼	—	98½	92½	100¼	101⅜	104⅝	105⅛	—	109	107	107	109⅜	110⅜	110½	109	110½	109	106¼	98	99	99½	101½	99¼	107	104¾
Nov.	99⅛	99⅛	98⅜	98⅜	98⅛	100	100¾	109	98¼	100¼	101⅜	104⅝	105⅛	—	101	99¼	90¼	93	86⅜	—	88¼	90¼	88¼	88¾	88¼	—	108¼	108¾	91	93	91¼	91¼
Dec.	106¾	108⅝	107⅜	107¾	108⅛	—	108	109	109¼	106	105⅛	105⅞	—	101	—	99¼	90¼	93	88¼	—	88¼	90¼	88¾	88¾	—	—	—	—	93	93	91¼	98½
1926																																
Jan.	—	67	—	87	87¼	85⅛	86⅛	87½	87¾	—	88⅛	88¼	88¼	85⅞	84⅝	82½	82⅜	75⅜	75½	75¼	75	72	72⅛	—	66¼	67	69¼	70⅛	69	—	—	79½
Feb.	—	67⅛	66¾	—	66¾	69	—	—	67	65	66	66	65⅜	—	63	60⅜	60⅜	60	59	—	—	56	56	55	51¼	52	51	—	—	—	—	62¼
Mar.	55	58	53	53⅜	53¾	57⅛	56	56½	55½	58	61	60	60	61⅜	62	63	61⅜	62	61⅛	61½	—	61⅛	61	60	59¼	59½	60	—	59⅛	58½	58	59
Apr.	—	—	59	59	59	58	56½	56½	58	—	49⅞	49⅞	50⅜	48⅞	47⅞	49⅞	47⅞	47⅞	47⅞	47½	47⅞	47¼	46¾	46	48½	48	48	48	48	48½	48	51¼
May	48¼	49	50	50¼	49½	49¾	49¾	49⅞	49⅞	49	49	48⅞	48⅞	47⅞	47⅞	47⅞	47⅞	47⅞	47⅞	47⅞	47⅞	44	44	—	43½	43	43	43	43	43	43	47¾
June	41⅞	42	41⅞	42	—	—	41⅞	41⅞	42	41¾	42	42	42	42	42	43	43	43	43	43	43	44	44	43½	—	45	45	42	42	42	42	42¾
July	43	43	42	42	41¾	41¾	41¾	41½	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41½	41½	41½	41½	41½	41½	42	42	42	41	41¾
Aug.	40¼	40¾	38½	38¾	37	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾
Sept.	40¼	40¾	40¾	43¾	42¾	42¾	42½	42¼	42½	42½	42½	42½	42½	42½	42½	42½	42½	42½	42½	42½	42½	42½	42½	42½	42½	42½	42½	42½	42½	42½	42½	42½
Oct.	43	43	41	41¾	41¾	41½	41½	41½	41½	42¾	42¾	42¾	42¾	42¾	42¾	42¾	42¾	42¾	42¾	42¾	42¾	42¾	42¾	42¾	42¾	42¾	42¾	42¾	42¾	42¾	42¾	42¾
Nov.	41¼	41¼	41¼	41¼	41¼	41½	41½	41½	41½	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾
Dec.	36⅜	37½	37½	37½	37½	—	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37
1927																																
Jan.	—	—	38½	39	39	39¾	40¾	40¾	40¾	40½	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾
Feb.	—	37⅜	37⅜	37⅜	37⅜	37⅜	37⅜	37⅜	37⅜	37⅜	37⅜	37⅜	37⅜	37⅜	37⅜	37⅜	37⅜	37⅜	37⅜	37⅜	37⅜	37⅜	37⅜	37⅜	37⅜	37⅜	37⅜	37⅜	37⅜	37⅜	37⅜	37⅜
Mar.	39¾	39¾	40	40¾	41	41	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾
Apr.	41¾	41¾	40	40¾	40¾	41	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾	41¾
May	—	40⅝	40⅜	40⅜	40½	41	39⅝	39½	40⅜	40⅜	40⅜	40⅜	40⅜	40⅜	40⅜	40⅜	40⅜	40⅜	40⅜	40⅜	40⅜	40⅜	40⅜	40⅜	40⅜	40⅜	40⅜	40⅜	40⅜	40⅜	40⅜	40⅜
June	40⅝	40¾	40⅜	40⅜	40⅜	40⅜	40⅜	40⅜	40⅜	40⅜	40⅜	40⅜	40⅜	40⅜	40⅜	40⅜	40⅜	40⅜	40⅜	40⅜	40⅜	40⅜	40⅜	40⅜	40⅜	40⅜	40⅜	40⅜	40⅜	40⅜	40⅜	40⅜
July	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Aug.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sept.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Oct.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nov.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dec.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Average Spot Closing Prices--Ribbed Smoked Sheets

(New York Market)

Average Price per Pound for Years 1910-1921

Year	*Cents*	*Year*	*Cents*	*Years*	*Cents*
1910	206.60	1914	65.33	1918	60.15
1911	141.30	1915	65.85	1919	48.70
1912	121.60	1916	72.50	1920	36.30
1913	82.04	1917	72.23	1921	16.36

Average Monthly Price per Pound since 1922

Months	1922 *Cents*	1923 *Cents*	1924 *Cents*	1925 *Cents*	1926 *Cents*	1927 *Cents*
Jan.	18.82	32.73	25.86	36.71	79.50	38.75
Feb.	16.12	35.14	25.29	36.01	62.25	38.25
Mar.	14.53	34.21	22.83	41.00	59.00	41.04
Apr.	15.99	32.48	22.51	43.64	51.25	40.86
May	15.25	27.39	18.89	58.47	47.75	40.76
June	15.11	26.88	18.81	77.26	42.50	
July	14.67	26.10	22.16	103.16	41.03	
Aug.	13.93	28.84	26.17	82.99	38.50	
Sept.	14.44	28.95	27.56	88.88	41.00	
Oct.	19.78	26.93	31.13	98.01	42.50	
Nov.	23.88	27.14	34.33	104.80	38.50	
Dec.	27.42	26.60	37.88	98.51	38.25	
Average for Year	17.50	29.45	26.20	72.46	48.50	

London Closing Prices of Ribbed Smoked Sheet

(In pence per pound)

Fifth Restriction Year—Third Quarter

Day	*May*	*June*	*July*	*Day*	*May*	*June*	*July*
1	—	19¾		16	19¾	16⅞	
2	19⅝	19½		17	19¾		
3	19¾	19⅝		18	19¼		
4	19¾	—		19	19¾		
5	19⅞	—		20	19¾		
6	19⅞	—		21	19¾		
7	19⅞	19⅛		22	—		
8	—	18⅞		23	19¾		
9	19⅞	18½		24	19⅞		
10	19⅞	—		25	19⅞		
11	19¾	18¼		26	19⅞		
12	19¾	—		27	19¾		
13	19¾	18		28	19¾		
14	19¾	17⅞		29	—		
15	—	17¼		30	19¾		
				31	19¾		

(The average price for the period for which daily prices are reported above is approximately 19.392 pence. The British Colonial Secretary has announced that only 60% of the standard production will be exportable from the restricted area during the next quarter if the price during the entire current quarter does not average at least 21 pence.)

Average Price in Previous Quarters

Quarter	1922-23	1923-24	1924-25	1925-26	1926-27
Nov.-Jan.	14.285	14.175	17.9983	46.709	19.265
Feb.-Apr.	16.858	12.917	19.356	28.103	19.696
May-June	14.242	10.974	38.469	21.001	
Aug.-Oct.	14.944	14.632	43.269	20.199	

Spot Closing Cotton Prices

(Middling Upland Grade—New York Market)

Recent Daily Price Per Pound

Day of Month	*May Cents*	*June Cents*	*Day of Month*	*May Cents*	*June Cents*	*Day of Month*	*May Cents*	*June Cents*
1	——	16.95	11	15.60	17.05	21	16.30	
2	15.45	17.00	12	15.75	——	22	——	
3	15.85	16.85	13	15.75	16.60	23	16.60	
4	15.95	16.75	14	15.75	16.80	24	16.55	
5	15.80	——	15	——	16.95	25	16.50	
6	16.00	16.35	16	15.70	16.90	26	16.50	
7	15.95	16.40	17	15.70		27	16.75	
8	——	16.60	18	15.80		28	16.75	
9	15.75	17.10	19	16.20		29	——	
10	15.75	17.05	20	16.20		30	——	
						31	17.05	

Average Monthly Price Per Pound

Month	1925 *Cents*	1926 *Cents*	1927 *Cents*	*Month*	1925 *Cents*	1926 *Cents*	1927 *Cents*
Jan.	23.99	20.85	13.42	Aug.	23.72	18.57	
Feb.	24.70	20.60	14.10	Sept.	23.79	17.02	
Mar.	25.64	19.35	14.32	Oct.	21.77	13.14	
Apr.	24.54	19.13	14.75	Nov.	20.94	12.86	
May	23.41	18.92	16.07	Dec.	20.06	12.68	
June	24.13	18.57		Average for Year	23.45	17.53	
July	24.68	18.71					

Stock of Crude Rubber in the U. S.

(All Quantities in Long Tons)

At	ON HAND			AFLOAT			AND AFLOAT ON HAND		
End of	1925	1926	1927	1925	1926	1927	1925	1926	1927
Jan.	60,870	55,198	76,172	36,759	46,296	45,312	97,629	100,434	121,484
Feb.	54,109	58,035	91,186	41,475	46,935	42,166	95,584	104,970	133,352
Mar.	52,494	61,822	85,740	40,577	43,567	49,600	93,071	105,389	135,340
Apr.	50,143	55,261	92,757	53,465	41,905	38,963	103,608	97,166	131,720
May	52,064	64,360	94,563	46,846	40,303	33,157	98,910	104,663	127,720
June	50,997	60,460		51,202	40,907		102,199	101,367	
July	46,245	64,900		46,003	38,062		92,248	102,962	
Aug.	42,354	60,870		41,254	37,360		83,608	98,230	
Sept.	36,367	62,078		55,151	42,464		91,518	105,542	
Oct.	34,085	64,989		51,098	52,930		85,183	117,919	
Nov.	34,885	69,385		42,692	47,311		86,577	116,696	
Dec.	51,215	72,520		48,208	52,020		99,423	124,540	

(Rubber Association of America figures raised to 100%.)

Stock of Crude Rubber in London

(No. of tons in Wharves and Warehouses, including Latex)

At End of:	1920	1921	1922	1923	1924	1925	1926
January	19,300	56,573	67,252	73,498	57,460	27,172	9,994
February	18,329	59,439	67,623	70,483	56,732	23,425	10,004
March	18,969	63,913	66,670	63,438	55,647	18,104	13,750
April	20,072	68,759	68,637	58,770	54,559	12,949	18,951
May	20,921	70,403	70,146	54,439	51,615	5,895	20,896
June	22,517	69,408	71,597	51,050	51,115	5,318	28,894
July	25,346	71,065	71,515	49,937	52,073	4,258	27,727
August	30,674	73,211	72,112	48,427	49,700	4,619	30,764
September	35,504	72,175	70,977	54,523	44,011	5,453	35,077
October	41,743	69,229	68,536	58,891	37,523	5,086	42,141
November	45,550	70,786	68,548	60,074	33,593	3,869	44,057
December	50,652	69,792	72,299	60,246	29,488	5,697	48,921

At End of Recent Weeks

	First Saturday	Second Saturday	Third Saturday	Fourth Saturday	Fifth Saturday
1926					
October	36,065	37,226	39,650	41,080	42,141
November	43,045	43,299	44,553	43,859	—
December	44,395	46,349	47,324	48,382	—
1927					
January	48,948	50,756	52,484	53,662	54,786
February	55,740	56,939	56,962	58,659	—
March	59,945	61,516	61,300	63,167	—
April	62,634	63,861	65,033	65,511	67,034
May	68,187	68,041	66,668	67,054	
June	67,105	67,454			

Rubber in Singapore and Penang

(Stocks held by Dealers—Quantities in Long Tons)

End of	1925	1926	1927	End of	1925	1926	1927
Jan.	15,925	15,726	25,440	July	15,894	23,101	
Feb.	17,320	13,653	26,766	Aug.	17,251	23,362	
Mar.	17,261	18,389	27,844	Sept.	16,526	25,997	
Apr.	15,368	16,328	24,543	Oct.	15,346	26,614	
May	15,804	16,967	25,133	Nov.	19,788	25,466	
June	15,884	19,416		Dec.	18,840	26,443	

Rims Inspected and Passed in U. S.

(Tire & Rim Association Reports)

	Total	Per Cent Balloons		Total	Per Cent Balloons
1923	23,140,620	0.6	1925	26,001,664	66.8
1924	21,863,311	19.7	1926	24,199,524	78.8
1926			1927		
July	2,123,368	84.8	January	1,489,078	77.0
August	2,378,850	82.3	February	1,753,224	84.4
September	2,365,518	80.7	March	2,071,989	85.1
October	1,828,539	76.9	April	2,060,868	88.0
November	1,210,472	77.0	May	2,169,208	86.9
December	1,096,429	76.7	June		

U. S. Consumption of Gasoline

(In Barrels of 42 Gallons)

MONTHS	1924	1925	1926	1927
January	11,918,000	14,386,000	17,582,000	17,888,000
February	9,626,000	13,210,000	15,814,000	18,240,000
March	10,961,000	14,890,000	19,302,000	22,464,000
April	14,583,000	19,013,000	20,848,000	23,371,000
May	15,889,000	20,459,000	24,213,000	
June	16,421,000	20,724,000	23,803,000	
July	18,610,000	22,879,000	24,752,000	
August	19,825,000	22,323,000	26,912,000	
September	16,871,000	20,177,000	22,929,000	
October	18,029,000	19,826,000	23,973,000	
November	16,607,000	18,024,000	20,618,000	
December	15,663,000	17,954,000	21,419,000	
TOTAL	185,003,000	223,865,000	262,165,000	

U. S. Tire and Tube Statistics

(All Figures Represent Thousands)

AUTOMOBILE CASINGS

Figures for Recent Years

	1922	1923	1924	1925	1926
Production	40,932	45,259	51,633	60,845	61,237
Shipments	39,987	45,204	50,120	59,262	59,002
Inventory[2]	6,132	5,772	7,427	8,142	10,456

Figures for Recent Months

	PRODUCTION			SHIPMENTS			INVENTORY		
	1925	1926	1927	1925	1926	1927	1925	1926	1927
Jan.	4,740	4,587	4,965	4,013	2,974	4,932	7,949	9,947	10,432
Feb.	4,908	4,865	5,095	3,924	3,436	4,458	8,928	11,164	11,07a
Mar.	5,276	5,456	6,276	4,657	4,561	5,701	9,510	12,004	11,583
Apr.	5,341	5,346	6,299	5,498	4,980	5,701	9,088	12,461	12,122
May	5,467	5,023		5,954	5,211		8,611	12,343	
June	5,418	5,422		6,737	5,724		7,243	11,968	
July	5,587	4,950		6,298	6,337		6,421	10,592	
Aug.	5,607	5,872		4,760	6,744		7,261	9,732	
Sept.	5,007	5,706		4,569	6,040		7,681	9,318	
Oct.	4,505	5,103		5,580	4,544		6,670	9,917	
Nov.	4,229	4,324		3,671	3,733		6,955	10,297	
Dec.	4,760	4,683		3,601	4,718		8,142	10,456	

AUTOMOBILE INNER TUBES

Figures for Recent Years

	1922	1923	1924	1925	1926
Production	50,850	60,116	70,706	82,614	76,618
Shipments	49,673	59,072	68,016	81,004	71,591
Inventory[2]	7,643	8,425	11,052	11,313	16,200

Figures for Recent Months

	PRODUCTION			SHIPMENTS			INVENTORY		
	1925	1926	1927	1925	1926	1927	1925	1926	1927
Jan.	6,343	6,809	5,337	5,576	3,723	6,016	11,570	14,361	15,585
Feb.	6,339	6,825	5,658	4,971	3,736	5,120	13,023	17,090	16,075
Mar.	7,000	7,030	7,184	5,711	4,987	6,157	14,236	19,131	17,096
Apr.	6,851	6,554	7,373	6,704	5,051	6,359	13,618	20,674	17,801
May	6,846	6,149		8,040	6,304		12,501	21,141	
June	6,942	6,171		9,032	6,898		10,409	20,243	
July	7,544	5,729		9,140	8,569		8,635	17,267	
Aug.	7,618	7,424		6,923	9,579		9,271	15,462	
Sept.	7,254	7,590		6,665	7,762		9,950	15,312	
Oct.	6,612	6,208		7,845	5,474		8,726	15,929	
Nov.	6,266	4,852		5,406	4,045		9,491	16,604	
Dec.	6,999	5,277		4,991	5,463		11,313	16,200	

(1) Rubber Association of America figures, raised to 100%. The Association estimates its figures to be 75% representative or complete when issued and that basis has been accepted when preparing the statistics in this table.

(2) Held by manufacturers at end of period indicated.

Automobile Production

	Passenger Cars			Trucks		
	Total	United States	Canada	Total	United States	Canada
1920	1,883,158	1,799,522	83,636	322,039	311,531	10,508
1921	1,514,000	1,452,902	61,098	147,550	142,402	5,148
1922	2,397,827	2,302,923	94,904	251,434	244,285	7,149
1923	3,719,164	3,589,936	129,228	378,288	361,078	17,210
1924	3,262,764	3,144,999	117,765	378,106	360,625	17,481
1925	3,817,639	3,678,328	139,311	498,019	475,941	22,078
1926						
January	284,703	272,922	11,781	33,461	29,763	3,698
February	334,524	319,763	14,761	41,685	37,608	4,077
March	399,105	381,116	17,989	49,233	44,848	4,385
April	401,836	383,907	17,929	53,887	50,314	3,573
May	394,569	373,140	21,429	51,343	47,838	3,505
June	358,360	339,542	18,818	47,043	44,110	2,933
July	328,816	315,863	12,953	41,847	39,592	2,255
August	393,040	380,258	12,782	47,907	45,404	2,503
September	363,537	350,913	12,624	51,299	46,428	4,871
October	300,142	289,547	10,595	46,965	42,890	4,075
November	226,278	219,504	6,774	39,410	36,356	3,054
December	143,413	137,361	6,052	30,002	28,302	1,700
TOTAL	3,928,323	3,766,336	161,487	534,082	493,455	40,629
1927						
January	208,718	196,973	11,745	40,874	37,243	3,631
February	275,458	260,632	14,826	41,947	38,118	3,829
March	360,754	341,665	19,089	48,590	45,056	3,534
April	373,961	353,071	20,890	48,216	44,495	3,721
May						
June						
July						
August						
September						
October						
November						
December						

Exports of Crude Rubber from Principal Producing Countries

(Figures in Long Tons)

	BRITISH MALAYA[1]								DUTCH EAST INDIES[2]						
	Gross Exports	Gross Exports minus Imports	Imports	Ceylon[2]	India & Burma[3]	Sarawak[4]	North Borneo[3]	Siam[4]	Java & Madura	Sumatra E. Coast	Other D.E.I.	Fr. Indo-China[3]	Amazon Valley[4]	All Other[5]	World Total[6]
1923	252,016	70,432	181,584	37,112	6,416	5,705	4,237	1,718	32,938	48,402	43,422	5,606	19,127	7,856	404,123
1924	259,706	108,524	151,182	37,351	7,697	6,699	4,621	2,962	42,446	53,483	80,347	6,688	22,906	9,065	425,447
1925	316,825	158,022	158,803	45,684	10,082	8,413	5,424	5,394	46,643	62,678	119,271	7,881	24,079	13,797	508,119
1926:															
Jan.	30,452	10,237	20,215	4,058	1,273	416	472	289	4,397	6,277	8,081	915	1,697	1,805	49,895
Feb.	30,440	8,306	22,134	4,941	725	488	450	253	4,474	5,734	6,801	554	2,169	1,978	50,701
Mar.	35,012	14,800	20,212	5,708	1,113	792	561	418	4,865	5,612	11,880	573	2,395	1,899	56,028
Apr.	23,727	10,565	13,162	3,484	590	679	374	293	4,522	4,598	6,208	410	1,778	1,529	37,627
May	31,231	10,604	20,627	3,600	691	927	410	279	4,742	5,293	8,606	502	2,144	1,464	49,285
June	30,624	11,764	18,860	3,906	452	779	512	275	5,440	6,111	9,844	549	1,367	1,279	49,374
July	28,624	15,280	13,544	4,800	938	911	420*	439	4,929	5,522	12,864	1,521	1,246	1,148	48,282*
Aug.	34,625	13,595	21,030	5,246	521	890	420*	316	4,418	3,472	10,349	378	1,411	1,097	49,548*
Sept.	35,913	13,972	21,941	6,027	652	888	420*	457	4,326	6,757	10,971	681	1,463	822	55,405*
Oct.	39,367	15,203	24,164	6,026	635	805	420*	385	4,193	6,988	11,513	661	1,616	1,023	58,429*
Nov.	34,302	12,201	22,101	4,687	1,111	685	420*	285	4,060	5,746	8,998	718	1,780	1,259	51,850*
Dec.	36,811	14,716	22,095	6,361	1,177	895	420*	338	5,025	7,106	12,333	790	2,492	714	59,746*
	391,328	151,243	240,085	58,844	9,878	9,155	5,299*	4,027	55,391	69,216	118,448	8,252	21,558	16,017	616,170*
1927:															
Jan.	34,946	14,995	19,951	6,697	921	959	500*	304	4,184	6,705	10,541	941	3,096	981	55,780*
Feb.	27,328	11,607	15,921	3,571	1,123	522	500*	360	4,707	6,526	10,634	675	2,476	1,098	48,113*
Mar.	41,246	17,464	23,882	7,141	1,469	997	500*	432	5,657	7,903	12,490	733	1,800*	1,350*	63,454*
Apr.	29,041	13,069	15,972	3,349		984		526				557			
May				3,124											
June															
July															
Aug.															
Sept.															
Oct.															
Nov.															
Dec.															

(1) Malayan net exports cannot be taken as production since imported rubber is largely wet native rubber which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 115 tons in 1923, 1,117 in 1924, 3,618 in 1925, and 3,263 in 1926. (2) Ceylon Chamber of Commerce statistics until 1926; rubber exported as latex is not included—such shipments were equivalent to 18 tons in 1923, 93 tons 1924, 6 tons 1925, and about 20 tons in 1926. (3) Official statistics. (4) Imports into Singapore and Penang. (5) Exports from "Other D.E.I." are chiefly wet native rubber which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 2,342 tons in 1923, 1,008 tons 1924, 2,239 tons 1925, and about 60 tons in 1926. In 1926, 196 tons of latex sprayed rubber and 125 tons of ficus rubber were exported from Java and Madura. (6) Calculated from official import statistics of principal consuming countries; viz., United States, United Kingdom, France, Germany, Italy, Belgium, and Netherlands. (7) This total includes the third column for British Malaya, "Gross Exports minus Imports," and all the figures shown for the other territories. *Figure is provisional; final figure will be shown immediately it becomes available.

Net Imports of Crude Rubber into Principal Manufacturing Countries

(Long Tons)

	United States	United Kingdom	France (abd)	Germany	Canada (ac)	Japan (ac)	Italy	Russia (ce)	Australia (cf)	Belgium (d)	Netherlands	Sweden (abcd)	Norway (abc)	Denmark (abd)
1919	236,977	42,671	19,951	5,584	8,770	10,688	9,894	75	733	3,995	2,771	2,022	437	673
1920	248,762	56,844	15,868	11,890	11,912	6,015	6,123	62	1,040	3,840	5,510	1,567	241	479
1921	179,678	42,087	16,981	21,920	8,248	22,981	3,906	165	554	1,705	1,022	813	178	251
1922	296,267	11,724	27,644	27,546	9,366	16,449	6,430	2,453	2,649	172	–3,807	1,248	321	87
1923	300,372	12,700	31,067	18,519	13,299	17,181	8,489	4,506	1,631	2,184	792	1,391	448	354
1924	317,747	–11,550	34,488	22,727	14,420	19,612	8,764	824	3,127	2,688	–807	1,781	669	473
1925	381,815	4,061	36,911	33,937	19,825	12,743	11,412	7,088	4,217	2,930	875	1,690	701	440
1926	395,667	84,865	39,390	22,775	20,253	18,125	9,809	6,529	7,860	2,498	2,665	2,125	609	575
1926:														
January	40,345	6,886	3,170	703	2,188	892	760	332	358	76	154	123	46	51
February	31,435	3,114	3,513	1,113	1,881	741	1,041	643	432	143	89	171	82	94
March	40,316	8,907	4,790	1,342	2,079	864	1,037	832	469	129	227	213	31	55
Apr.	33,416	8,275	4,834	1,781	1,624	1,868	865	402	431	71	93	204	27	23
May	28,705	6,773	2,937	1,848	1,239	1,010	705	200	386	186	241	110	24	47
June	23,795	5,894	2,327	1,655	1,188	1,465	1,070	983	546	269	214	178	20	34
July	34,266	6,768	2,603	2,202	1,552	1,447	800	132	586	295	480	195	34	27
Aug.	26,081	7,327	2,819	2,110	1,888	1,284	796	655	1,159	303	596	199	52	55
Sept.	35,675	8,843	2,900	2,029	1,355	1,922	819	472	1,125	283	430	159	43	27
Oct.	28,110	8,082	2,962	2,423	1,865	2,396	645	585	889	301	2	210	63	43
Nov.	37,673	9,247	3,194	3,007	1,548	3,380	832	568	802	194	–18	179	65	50
Dec.	35,850	4,749	3,341	2,562	1,846	856	439	725	677	248	157	184	122	69
1927:														
January	41,815	10,192	3,732	2,481	1,936	1,227	672	803	508	296	193	164	53	52
February	25,886	7,692	3,708	3,103	2,620	1,902	601	907	581	502	153	191	53	27
March	32,752	9,049	2,328	3,475	3,760	1,578	852	784		454	86	219	46	76
April	14,627	7,875	2,693	2,393	1,509	2,181		1,972		448		59		
May														
June														
July														
Aug.														
Sept.														
Oct.														
Nov.														
Dec.														

a—Including gutta percha. b—Including balata. c—Reexports not deducted. d—Believed to include scrap and reclaimed rubber. e—Russian statistics are exports from United Kingdom only to Russia. f—Australian annual statistics including 1924 are exports to Australia from Malaya, Ceylon, Dutch East Indies and United Kingdom; monthly figures and total for 1925 are exports from Malaya, Ceylon, and Java only. –Minus sign, reexports in excess of imports. *All statistics from original official trade returns.*

REVIEW DESK

CHROMIUM PLATING MADE EASY. Published by the Metals Protection Corporation, Indianapolis, Ind.

This attractively printed pamphlet contains a history of chromium plating. Ewood Haynes, who might be called the father of the American motor car, was the inventor of many alloy steels and the first man to conceive the value of chromium plating. In 1907 he filed his first patent application of stainless steel, a chrome-iron alloy and a few years later he patented Stellite, a chrome-cobalt alloy. Both alloys, were hard and non-corrosive, but their cost prevented their widespread use and adoption. When, however, the idea of electrolytically depositing chromium itself on baser metals to give them full protection against rust and wear was perfected, the Metals Protection Corporation was organized to commercially exploit plating with chromium. The trade name used was "Chromilite." Following this brief description of Haynes, the pamphlet contains a discussion of chromiliting costs, properties and applications.

* * * *

ADVERTISING AUTOMOTIVE PRODUCTS IN AFRICA. Compiled by J. A. G. Pennington, U. S. Department of Commerce. 28 Pages.

Probably no section of the world presents a more difficult problem in the way of securing reliable information in regard to industrial and economic conditions than does Africa—the last continent of colonies which are exploited by the parent European countries, our competitors in trade. No section of the world is richer in resources or progressing more rapidly at the present time, and it seems highly desirable that all advertising facilities which exist or can be devised should be utilized to acquaint the market with the peculiarly adapted features of American motor cars and trucks. This bulletin is the second of a series dealing with the subject of advertising automotive products in foreign countries. Its purpose is to disclose to exporters of American automotive equipment the facilities now in existence for carrying their message to these remote markets, and at the same time to reveal the forward steps being made which will inevitably give the courageous pioneer a profitable future market.

In this bulletin, each country is dealt with briefly in order to indicate the character of the market and the nature of the problem confronting the manufacturer who wants to popularize his product through publicity. The pamphlet is not intended as a market guide.

* * * *

NATIONAL SLEEVE VALVE AIR COMPRESSORS. Published by National Brake & Electric Co., Milwaukee, Wis. Catalog No. 807, 24 Pages.

This catalog describes with illustrations the latest development in air compressors and air compressing equipment of moderate capacity as manufactured by the National Brake & Electric Co. The compressors are equipped with a mechanically operated sleeve type of intake valve, which, the producers claim, affords operation at higher speeds and results in greater efficiency and extreme quietness.

* * * *

GREEN BOOK. Published by Oil, Paint and Drug Reporter. 1927 Edition. 828 Pages. $2.50. New York.

The Green Book affords a very comprehensive "who's who" in the chemical, dyestuff, drug, paint, oil and fertilizer industries. Since the first issue in 1913, each succeeding edition has been larger than the one before. The present edition is the biggest so far issued. It has been divided into three parts, the first containing a list of chemicals, dyes, intermediates, drugs, paints, oils, and other raw materials and manufactured products. The second section is concerned with machinery, apparatus and equipment, while the third section contains a directory of engineers, chemists and technical services. Commodities are listed in the book by their more familiar names. Cross-references are used whenever the commodity is known by several names.

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